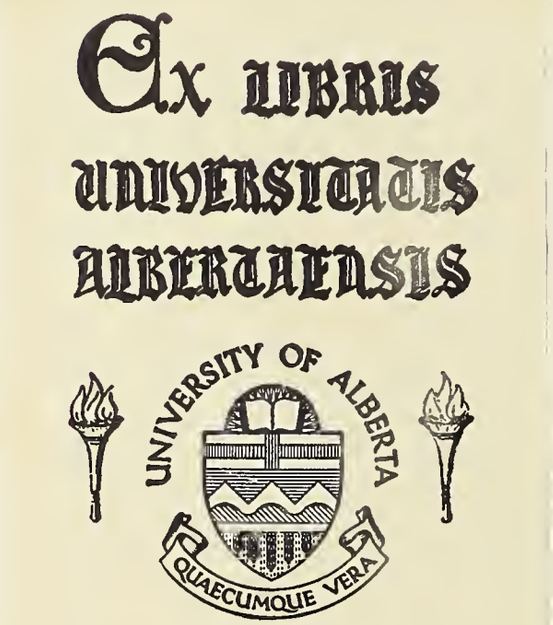
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THE UNIVERSITY OF ALBERTA

AN ANALYSIS OF STRAIN IN CONCRETE PAVEMENT STEEL

A DISSERTATION

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

DEPARTMENT OF CIVIL ENGINEERING

by

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EDMONTON, ALBERTA

April 1960

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES

The undersigned hereby certify that they have read and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled"The Analysis of Strain in Concrete Pavement Steel" submitted by Walter Babowal, B.Sc. in partial fulfilment of the requirements for the degree of Master of Science.

Date April 5/60

I. ABSTRACT

This is the second report dealing with the strains in the reinforcing steel in an experimental concrete road situated on the Trans-Canada Highway just west of Calgary, Alberta. Construction of the test project, consisting of unreinforced, conventionally reinforced and continuously reinforced slabs, was started in the fall of 1958 and was completed in the spring of 1959. Slab thickness varied from 6 to 8 inches and the steel varied from 0% to 0.815% of the cross-sectional area of the pavement.

Instrumentation was installed in order to measure steel strains, crack openings and slab temperatures. Measurements made of these three variables during the months of May 1959 to January 1960 are presented in this manuscript.

Results of the investigation indicate a completely different type of behavior for the conventionally reinforced concrete sections as compared to the continuously reinforced concrete sections. Overall length changes are relieved by movement over the subgrade for conventional sections and by straining of the concrete and steel for continuous sections. Widest cracks and maximum steel strains occured during the summer for conventional sections and during the winter for continuous sections. This seems to indicate that the most critical periods of the year are summer for conventional sections and winter for continuous sections.

Other findings indicate straight line relationships between steel strains, crack widths and slab temperatures. Seasonal behavior of pavement slabs and plastic flow of concrete are evident.

Another incidental finding is the bending of continuous pavements in a horizontal plane when they are placed on horizontal curves.

The determination of a minimum amount of reinforcing to prevent yielding in a continuous concrete pavement does not appear to be possible.

ACKNOWLEDGEMENTS

This investigation was made possible by the sponsorship of the Research Council of Alberta and the Alberta Department of Highways. Department of Civil Engineering, University of Alberta provided most of the equipment used in obtaining readings.

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II. INTRODUCTION

The search for better means of communications and transportation has led to the development of modern highways. With the development of modern highways has come research into various pavements. Research and experimentation are the only methods available for the evaluation of the performance of different highway pavements.

In 1958, the Alberta Department of Highways took another step forward in research, by starting construction of an experimental section of pavement as part of Highway No. 1, west of Calgary. This section, containing plain concrete, conventionally reinforced concrete and continuously reinforced concrete pavements, was completed in 1959.

Under the auspices of the University of Alberta and the Research Council of Alberta, instrumentation for the project was prepared and installed. Instrumentation was for the purpose of measuring elevation changes, crack widths, slab temperatures and steel strains.

This thesis is a continuation of the work started in 1958 by J.S. Bereznicki. (1)

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(1) Refers to Bibliography

III. OBJECTIVES

The scope of study as presented in this thesis may be outlined as follows:

1. A review of recent literature to summarize the theories presented for continuously reinforced concrete pavements.
2. To present the behaviour of both conventional and continuous sections approximately one year old.
3. To present the behavior of conventional sections constructed in the spring of 1959.
4. To show the seasonal behavior of pavements.
5. To compare spring and fall construction of conventional sections.
6. To compare conventional and continuous sections.
7. To try to determine the percentage of steel required in continuously reinforced concrete pavements.

IV. THEORY

The behavior of a reinforced concrete pavement is dependent upon several factors which fall into three categories which are characterized by the degree of control over these same factors. The quality of the pavement constituents which are concrete and steel may be controlled to a high degree. Temperature and moisture are dependent upon the erratic behavior of nature, and because of this, we have no control over them. The third group is characterized by partial control. Shrinkage effects can be minimized by reducing concrete slump and by providing a good distribution of steel. Friction is partially controlled by the choice and placing of subgrade material. Wheel loads can be estimated and governed, but there is still no guarantee that the limit will not be exceeded.

SHRINKAGE

When first poured, concrete is in a plastic state. The water that makes up part of this plastic mass is used up in hydration and evaporation thus causing a volumetric decrease. A decrease in volume must cause longitudinal as well as lateral and vertical contraction.

Longitudinal shrinkage sets up tensile forces in the concrete and causes the first cracks to appear. Shrinkage cracks are the widest cracks which occur and they set the pattern for future cracking.

Lateral and vertical shrinkage aid in bond development. The concrete will tend to contract around the embedded steel thus

giving rise to adhesive bond. Elimination of large temperature variations during curing is desirable since they cause differential movements between the concrete and the steel and results in poor bond.

Reinforcing steel is placed in concrete not to eliminate shrinkage but to control it by distributing shrinkage strains throughout the entire length, thus causing numerous small cracks rather than few large ones to appear. Since bond is believed to develop more rapidly than the concrete tensile strength, (6) much longitudinal length change is prevented, and tensile forces are set up within the concrete. Whenever the resulting tensile force exceeds the concrete tensile strength, a crack will occur. However, if the force is insufficient to cause cracking, a residual tensile stress will remain. This may require only a small additional force to cause cracking.

TEMPERATURE

Temperature has the most significant effect on a concrete pavement. An increase or decrease in temperature creates a corresponding change in slab length. The magnitude of the length change depends on the thermal coefficients of the concrete and steel.

If the slab is restrained in any manner, free movement cannot take place and compressive or tensile forces are then set up within the concrete and the steel. The magnitude of the stress in the concrete and steel is difficult to assess since it is uncertain how much movement of the slab occurs.

Another effect of temperature is curling of the slab. Temperature differential causes unequal expansion or contraction of top and bottom surfaces, thus setting up warping stresses within the slab.

These stresses are actually small when compared to the longitudinal stresses.

MOISTURE

One effect of moisture is to cause warping within the slab. The bottom is generally at the same moisture level as the supporting subgrade, while the top is exposed to rain and sun. The difference in moisture causes warping of the edges. Moisture differential is also believed to be responsible for a varying crack width throughout the depth of the slab.

Moisture content has a further effect on the thermal coefficient of concrete.[2] [7] During the summer when the slab is alternately wet and dry, the thermal coefficient can vary appreciably. If the temperature drops below freezing then rises again, the concrete could quite conceivably have a different coefficient of thermal expansion than it had before it was exposed to the freezing temperatures. A varying thermal coefficient will cause variations in concrete and steel stresses.

WHEEL LOADS

Wheel loads cause the pavement slab to deflect thus producing flexural stresses in the top and bottom of the slab. Pavement thickness is selected on the basis of these stresses produced by wheel loads at corners, edges or centers of slabs depending upon whichever condition is the most critical.

Shearing stresses may also be produced in the longitudinal steel when the steel must transfer the load across a crack. This would occur when a crack becomes too wide for aggregate interlock to transfer the load adequately.

FRICTION

Friction, as applied to concrete pavement slabs, denotes the developed resisting force of the subgrade due to the movement of the pavement slab over it. The magnitude of the force developed depends on the contact between the subgrade and the slab, the amount of movement and the rate of movement. The friction under a concrete pavement slab therefore varies from zero with no movement up to a maximum value at the time when the slab is sliding over the supporting subgrade. When sliding occurs, the friction force is constant.

Friction is measured by a coefficient of friction. The actual value cannot be determined exactly but it is known to vary between 1 and 2, and is generally assumed to be 1.5. Friberg (2) suggests that the coefficient for a continuous pavement may be much less than normally assumed.

There are two distinct coefficients of friction. One is a daily coefficient associated with the rapid movements caused by daily temperature changes and has a high value. The second is a seasonal coefficient, associated with seasonal temperature and overall length changes. Its value is considerably lower than the daily coefficient because the subgrade has time to adjust to changing conditions.

Friction always opposes movement. As a result of this action, shearing stresses are produced along the bottom surface of the slab. Since the friction force is opposed to the direction of movement, it reduces the strain in the steel at a crack when contraction occurs and it produces tensile strains in the concrete.

CONCRETE

Four concrete properties, compressive strength, tensile strength, flexural strength, and the modulus of elasticity influence the behavior of a concrete pavement. Since none of these properties is independent of the rest a change in mixture design affects all of them.

As slab temperatures increase and the slab expands, compressive stresses due to the aforementioned subgrade restraint are produced in the concrete. The compressive strength of the concrete should be such that it can safely withstand this compression caused by expansion. A high compressive strength is generally not required because the slab has a relatively large cross-sectional area thus keeping the compressive stresses low.

The tensile strength of the concrete controls the cracking pattern. The concrete will crack whenever its tensile strength is exceeded. Hence a low tensile strength will facilitate frequent cracking. On the other hand wheel loads cause pavement slabs to deflect thus producing a flexural stress in the surfaces of the slab. If the flexural strength is low, then the slab will crack excessively and lose much of its rigidity. Raising the flexural strength also raises the tensile strength. Since it is impossible to obtain both a high flexural strength and a low tensile strength from any mix design, some compromise between the two must be accepted.

The modulus of elasticity of concrete is a function of the compressive strength. The magnitude of the temperature stresses is governed by the value of the modulus of elasticity of concrete.

STEEL REINFORCING

Steel reinforcing in a concrete pavement slab must perform three functions. The first function is the control of shrinkage, and the second function is temperature reinforcing. By taking advantage of the increased slab rigidity due to placing steel in the concrete pavement for the two purposes mentioned previously, the number of joints may be reduced.

In its function of temperature reinforcing, the steel must do several things. First it must cause the concrete to crack at some predetermined interval. To do this, the total yield point strength of the reinforcing must be approximately equal to the total tensile strength of the concrete or else the reinforcing will yield before cracking occurs. Once cracking occurs, the steel must provide continuity across the crack. The steel must also keep the cracks narrow enough to provide adequate aggregate interlock for transferring loads and to prevent infiltration of foreign material.

CONVENTIONALLY REINFORCED CONCRETE PAVEMENTS

Since conventionally reinforced concrete pavements have been constructed for years, design procedure has become standardized. The Portland Cement Association [3] has presented a fairly good theory and design procedure for this type of pavement. The theory presented in this thesis for conventionally reinforced concrete pavements, is a summary of this article.

Traffic and volume changes are the two main sources of stresses in the pavement slab. The thickness of the slab and the concrete are selected in such a manner as to be able to withstand these stresses and still provide an economical pavement. The flexural rather than the compressive strength of concrete is used

in design.

Wheel loading produces bending moments in the slab which in turn result in flexural stresses. The most critical loading is a corner loading; the next most critical is an edge loading, and finally interior loading as the least critical of the three. Whenever the bending moment, due to wheel loading, is of such magnitude that the flexural stress exceeds the flexural strength of the concrete, the concrete will crack.

Volume changes are caused by temperature and moisture changes. Temperature and moisture variations throughout the depth of the slab cause curling or warping of the slab. The significance of curling is that subgrade support is reduced because corners and edges tend to lift at certain times. Curling stresses are generally not considered to increase the magnitude of the flexural stresses produced by wheel loads since the more frequent condition is a reduction in the magnitude of the flexural stresses.

Subgrade support is an important factor. The thickness of the pavement is dependent to some extent on the value of subgrade support. Another property of the subgrade is the amount of friction that can be developed. Therefore, this will influence the distance between joints and the amount of distributed steel reinforcing required.

Jointing is the most common method of relieving length changes. Whenever distributed steel is used, the number of joints may be reduced. The principal function of the steel is to keep cracks tight in order to provide adequate aggregate interlock and to prevent infiltration of foreign materials.

Distributed steel is generally designed to withstand tensile stresses only. The maximum tensile force in the steel across a crack is the force necessary to overcome friction between pavement and subgrade from the crack to the nearest free edge or joint. The force will be a maximum when the crack occurs at the middle of the slab.

The amount of steel required is given by the following formula:

$$As = \frac{L\ f\ W}{2S}$$

where

As = area of steel in square inches required per foot of width of slab.

L = distance in feet between joints.

f = coefficient of friction assumed 1.5. Its value may range from 1 to 2.

W = weight in pounds of 1 square foot of slab.

S = allowable working stress, psi, in steel generally limited to one half the yield point stress of the steel.

Experience has shown that small bars and welded wire fabric are more effective than larger bars of the same total area. Small bars and welded wire fabric can be more uniformly distributed throughout the pavement than the large bars. Mechanical interlock is also provided by the transverse wire of the welded wire fabric.

CONTINUOUSLY REINFORCED CONCRETE PAVEMENTS

In an effort to provide a smoother riding pavement, a continuously reinforced concrete pavement has been suggested.

Several theories for the behavior of continuous pavements have been presented. Although no particular theory is adequate within itself, they do agree on several aspects of continuous pavement behavior.

The following pages of this thesis are summaries of current literature on continuous pavements. The summaries are presented in chronological order with a comparison of the theories made at the end.

WORK OF C.P. VETTER (8)

Vetter presented the first theory in a paper dealing with the stresses produced, due to volume changes, in a continuous reinforced concrete structure. These volume changes are caused by shrinkage, temperature and swelling or possible combinations of the three. Formulas with which it is possible to calculate the amount of steel required to reinforce for these volume changes are presented.

Reinforcing steel does not prevent shrinkage but controls it by causing numerous small cracks rather than few large ones to appear. The minimum percentage of reinforcement, based on the total cross-sectional area required for shrinkage only, is given by the formula

$$P = \frac{\text{tensile strength of the concrete}}{\text{yield point strength of the steel}}$$

This formula is based on three boundary conditions. Since the concrete and steel must change in length by the same amount, the compressive strain in the steel must equal the longitudinal shrinkage minus the tensile elongation of the concrete. Secondly, since the steel stress at a crack is transferred by bond to the concrete, the bond stress must equal the tension in

the concrete or the total change in the steel stress. Thirdly, the total shortening of the steel in the bonded region must equal the total elongation of the steel at a crack since the total length of the steel cannot be changed. Therefore the total compression strains in the steel between cracks must equal the total tension strains in the steel at cracks.

The distance between shrinkage cracks may be reduced by low concrete tensile strength, high volumetric shrinkage, high steel area, high bond strength and a large perimeter to area ratio.

The minimum percentage of steel required as temperature reinforcing is given by the formula

$$P = \frac{S'c}{Ss - nS'c}$$

where

P = % reinforcing by area

S'c = tensile strength of the concrete

Ss = yield point strength of the reinforcing

$n = \frac{Es}{Ec}$ = modular ratio

This formula is based on the three conditions described previously.

The formula for the required percentage of steel makes no reference to temperature. Therefore the maximum steel stress is independent of the temperature drop. As the temperature drops, the steel stress at a crack keeps increasing until the yield point is reached. There is now enough stress in the steel to cause the concrete to crack at some other plane of weakness and relieve the steel stress at the former crack. With a further decrease in temperature, the same process is repeated until enough cracks have formed to

relieve the stresses produced by the maximum temperature drop.

When temperature and shrinkage effects are considered together, it is found that cracks occur at closer intervals than if temperature or shrinkage were considered separately. Therefore, the resulting steel stress is lower than when shrinkage and temperature are considered separately.

THE WORK OF W.R. WOOLLEY (9)

In the first paper presented, Woolley utilized Vetter's equation for the minimum amount of temperature reinforcing required. Several factors which tend to reduce steel stresses at cracks are also introduced.

The general assumption made for continuous slabs is that the steel takes very little stress until the concrete cracks. Once a crack occurs, the steel is required to take all of the stress at the crack. The stress is then transferred back to the concrete by means of the bond between the concrete and the steel.

The fact that a crack opens means that the steel has stretched and the bond has broken for some distance on each side of the crack. The opening of a crack relieves the tension in the concrete, but if the temperature continues to drop, more tension will be built up in the concrete. If the steel is inadequate, then it will stretch and allow the formation of an open crack. However, if the total tensile strength of the steel exceeds that of the concrete, another crack will form and relieve the stress in the steel.

If the total strength of the steel is larger than the total strength of the concrete in tension, the concrete will crack thus making the maximum steel stress independent of the temperature drop as explained by Vetter. The temperature range for a concrete pavement slab is about 100°F. If the steel is fixed at the ends, then

a stress of approximately 18,000 psi is introduced in it as a result of the temperature drop. The yield point stress should be reduced by this amount when computing the working stress for design purposes. The amount of steel required is thus given as 1% by Vetter's equation.

In a later paper, (10) the author admits his first approach using an effective yield point was not correct. Even Vetter's formula giving 0.7% steel is considered conservative for the reasons explained in the following paragraphs.

Upon setting, fresh concrete shrinks but the steel must remain at the same length. This causes numerous small cracks in the concrete and reduces the overall change in length. The slab is partially cracked so that when a temperature drop occurs, the steel does not have to pull the entire section apart.

Wheel loads and warping also cause cracks so that when cold weather comes, many cracks already exist. These cracks act as miniature contraction joints relieving the stress in the steel.

Sustained cold weather causes the concrete to be continually in tension. The concrete will then creep under this sustained stress while the steel remains at the same length. Creep will increase the magnitude of the tensile stress in the steel away from a crack and decrease the tensile steel stress at a crack.

A higher crack frequency is caused by inefficient curing and large steel percentages. A close crack spacing results in low steel stresses, and high concrete shearing stresses due to a shorter radius in bending under external loads.

As explained previously, the steel stress should not increase beyond a certain maximum value with dropping temperatures. However, the steel stress does increase. The suggestion is made that the

tensile strength of the concrete increases with decreasing temperatures thus making the concrete harder to crack. Therefore, the stress in the steel must also increase.

THE WORK OF B.F. FRIBERG (2)

Friberg presents a theoretical analysis of friction, bond, crack widths and steel stresses.

At some distance from its free end, the pavement slab becomes fully restrained due to friction. Frictional resistance will be zero at the restraint because no movement can take place. Proceeding towards the free end, frictional resistance will vary linearly with the distance up to the point of sliding. From this point up to the free end of the slab, the friction will remain constant because the slab slides over the supporting subgrade.

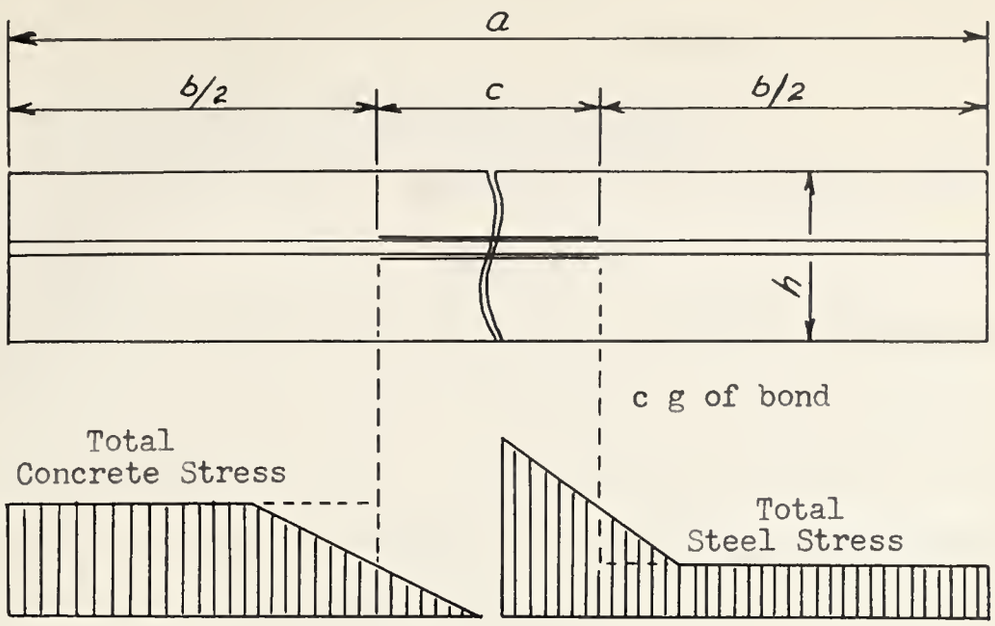
Friction is greatest for the first movement with a substantially reduced value for subsequent movements. The coefficient of friction may also be reduced by increasing slab thickness and length. A greater resistance to expansion than to contraction seems to be indicated. These reasons explain why both average and apparent friction appear to be much less than normally assumed.

If the temperature remains constant or if the thermal coefficients for concrete and steel are the same and the temperature varies, the concrete and steel will undergo the same strains until cracking occurs. The stresses in the steel and concrete are proportional to the value of the modular ratio. When a crack occurs, the concrete at the crack has no stress and the steel assumes all of the stress. Providing slip does not occur, the steel stress at a crack is transferred back to the concrete by active bond within a short distance on each side of the crack.

There will be some differential movement between the concrete and the steel at a crack. The movement is assumed equal to the slip at the loaded end for bond pullout tests with long embedment. If bond versus slip relationships are known for the steel, then changes in crack width can be computed as a function of the total force in the steel. The crack opening will consist of twice the slip at the loaded end for a bond pullout test with long embeddment.

Total elastic strains for the pavement are composed of concrete strains in fully bonded sections and reinforcing steel strains at a crack. The effective elastic modulus for a pavement with cracks is therefore much smaller than that for uncracked concrete. The effective elastic modulus increases with increasing distance between cracks and increasing percentage of steel reinforcing, but it decreases with increasing stress.

The concrete and steel stresses due to temperature change may be described by three equations. First, the total force at a crack must equal the total force halfway between cracks. Secondly, the length of concrete and steel in the bonded portion must remain equal regardless of temperature change and common length change. Thirdly, no overall change in length can take place. For these three conditions, three equations to enable the computation of stresses can be written.



FREE BODY DIAGRAM

Fig. 1

The free body diagram consists of a length of unbonded steel between two lengths of bonded concrete and steel. The ends of the section under consideration are fixed so that no overall change in length can occur. The length of each concrete and steel section is half the distance to the nearest crack. The length of the unbonded steel is taken as the distance from the centre of gravity of the bond on one side of the crack to the centre of gravity of bond on the other side of the crack. The length of active bond is determined by dividing the stress in the steel at the crack by the bond modulus or change in steel stress per inch of length. Friction is not considered to relieve the stress at a crack. Its function is to fix the ends of the section under consideration.

Steel stresses at a crack are reduced by increasing the unbonded length. Increasing the percentage of steel reinforcing also decreases the steel stress at a crack, but increases the concrete

stresses. If there is insufficient steel, then the steel must yield or lose bond rather than cause new cracks to form.

THE WORK OF I.J. TAYLOR AND W.J. ENEY (6)

Following several years of observation on an actual continuous pavement, this paper outlining factors affecting continuous pavements and proposing a design procedure, was presented.

During curing, the concrete decreases in volume, increases in strength and develops bond. The cross-sectional area is more readily reduced due to shrinkage than the length of the pavement because longitudinal shrinkage is opposed by base friction, end anchorage, tensile strength of the concrete and resistance of the reinforcing through bond. The concrete pulls away from weaker areas either causing cracks to form or leaving residual stress concentrations.

Dropping temperatures produce tensile strains which may exceed the elastic range and creep response rate of the concrete. A crack will then develop at a plane of weakness. The crack widens until the total tensile force at a crack exceeds the tensile strength of the concrete at another plane and a new crack is formed. Cracking will continue until the force of contraction becomes insufficient to cause further cracking. Each section between cracks then acts as a unit. Under sustained stress, creep occurs in the concrete thus reducing the possibility of formation of new cracks. If the rate of straining is slow enough, the creep potential of the concrete is such that the strains may be relieved by creep and no cracks develop. Due to creep, some of the stress from the concrete is transferred back to the steel.

Changes in moisture content of the slab cause volumetric changes. Moisture differentials are responsible for warping of the slab and for a varying crack width throughout the depth of the slab.

The contact between slab and subgrade creates friction which opposes any motion. At some distance from the free ends of the slab, friction develops to such an extent that complete restraint is obtained. The stresses and strains between points of complete restraint are localized in the vicinity of their origin. The reinforcement fixes the cracked ends of each individual element. Each cracked element will then contract and expand about its geometric centre. Absolute movements of cracked sections is reduced with the result that the base friction is practically insignificant.

Pavement design should be such that the total yield strength of the steel exceeds the total tensile strength of the concrete. The tensile strength of concrete can be estimated to be one tenth of the 28 day compressive strength. Cracks will occur when the rate of tensile straining exceeds the ability of the concrete to respond elastically. The reinforcement, without the aid of concrete, then spans the crack and responds to straining. If the total yield point strength of the steel is low, strains will be mobilized at the crack thus causing yielding. Cracks will widen and new cracks will occur only at widely separated intervals. When the total tensile strength of the steel is high, the tension in the concrete is only slightly relieved by elastic straining so that new cracks develop.

Crack widths should be limited to 1/32 inches in order to provide adequate aggregate interlock. Cracking pattern is not a dependable criterion in evaluating the soundness of a pavement since the pattern is influenced by curing, construction technique and humidity. The crack width is the only dependable criterion.

The authors suggest that 0.7% steel with a yield point of 60,000 psi should be adequate.

THE WORK OF M.D. SHELBY and B.F. McCULLOUGH (5)

This report from the Texas Highway Department outlines a design procedure based on theory and experience. This approach is used because all of the known variables which are tensile, bond and flexural concrete strength, tensile and shear strength of steel bond area, temperature, shrinkage coefficient of concrete, pavement modulus of elasticity, subgrade reaction, pavement fatigue resistance and loading conditions cannot be completely evaluated.

Present design is based on an interior loading condition with extra steel placed at the edge of a slab to carry the added stress of edge loading. Volume changes due to shrinkage and temperature drop are controlled by the use of reinforcing steel. A crack spacing of 5 to 6 feet is considered optimum with crack width limited to 0.02 inch to prevent infiltration and to provide adequate aggregate interlock.

For the first pavement constructed, enough steel was provided in order to insure that the total tensile strength of the steel exceeded the total tensile strength of the concrete. This resulted in 0.7% of hard grade steel. The crack spacing was from 3 to 4 feet which indicated that the amount of steel used was excessive from an economic standpoint.

There appear to be three reasons why this percentage of steel was excessive. One reason is the neglect of frictional resistance of the subgrade to volume change. The fact that cracks are narrower at the bottom than at the top lends support to this argument. Another factor is that plastic flow in the concrete tends to lower the stresses. The third reason is that tensile stresses in the concrete develop much more rapidly than the tensile strength of the concrete causing the concrete to crack at a lower tensile strength thus requiring less steel. Since these factors cannot be properly evaluated, the suggestion is made that 0.5% steel seems to be adequate.

Several projects did not have the same crack spacing for the same percentage of steel. The crack spacing was found to be dependent upon the bond area. Down to the point where bond area is sufficient to develop the yield strength of the steel, crack spacing is inversely proportional to the bond area.

"The stronger the concrete the better" may not be a good design relationship. The tensile strength of the concrete may be so great that it will overstress the steel. Therefore an upper and lower limit has been placed on the concrete flexural strength.

SUMMARY

All of the articles either state or imply that the free body diagram as proposed by Friberg most closely approximates the actual condition. The total yield point strength of the reinforcing should equal the total tensile strength of the concrete to cause the concrete to crack so as not to exceed the

yield point strength of the steel. Friction is not considered to relieve the steel stresses at a crack. Steel stresses at a crack are believed to be relieved by bond loss, shrinkage and plastic flow.

The suggested design procedure is to select the percentage of reinforcing steel on the basis of a limiting crack width. The yield point of the steel should then be such that the total yield point strength of the reinforcing is equal to the total tensile strength of the concrete. An upper limit should be placed on the strength of the concrete.

V. GENERAL DESCRIPTION

In the fall of 1958, The Alberta Department of Highways constructed 3 miles of a 4 1/2 mile test road west of Calgary, Alberta. In the spring of 1959 the remaining portion, as well as, a 1/2 mile section to the east of the Bow River crossing was completed. The cross-section consists of two 12 foot concrete lanes of varying thickness bounded by 10 foot asphalt shoulders. A 4 inch granular base course was used throughout. The dimensions and reinforcing in the sections are as follows:

(a) Plain Concrete

8 inch non-reinforced concrete slab 5239 feet long (Station 374 + 72.5 to Station 427 + 11.6) with load transfer joints every 20 feet.

(b) Continuously Reinforced Concrete Pavements

Section Type	Station From	To	Length in feet	Thickness in inches	Reinforcing Steel in %
B7-2	348+24.5	374+72.5	2648	7	0.784
B7-1	321+79.5	348+24.5	2645	7	0.706
B6-1	302+07.5	321+79.5	1972	6	0.715
B6-2	280+03.0	302+07.5	2204	6	0.815

Transverse reinforcing consists of 1/2 inch round bars at 30 inches.

(c) Conventionally Reinforced Concrete Pavement

Section Type	Station From	To	Length in feet	Thickness in inches	Reinforcing Steel in %
A-6	253+93.0	280+03.0	2610	6	0.185
A-7	223+03.0	253+93.0	3090	7	0.159
A-8	187+93.0	223+03.0	3510	8	0.139
	150+94.6	181+84.6	3090		

Transverse reinforcing consists of 1/2 inch round bars at 23 inches. Load transfer joints are spaced at 30 feet.

Construction was started during the first week of September, 1958 on Section type C. Construction ended with the start of freezing temperatures in the first week of November. All of the continuous pavement and Section Type A-6 of the conventional pavement had been completed. Pouring of concrete was resumed at the end of April, 1959 and completed at the end of May. Sections Type A-7 and A-8 were constructed during this period.

Instrumentation in the form of "SR-4" electrical resistance strain gages, crack width pins and thermocouples was installed at selected locations. A detailed account of instrumentation and installation is given in a previous thesis.(1)

One change was made in the instrumentation and another in the method of installation. Two thermocouples were used in series rather than singly as in the sections constructed earlier. Instead of carrying the lead wires from the gages through the granular base, a 2 inch electrical conduit through which the lead wires were brought to the terminal boxes at the south shoulder of the road was used. A capacitor was connected across the dummy gage in order to balance out any capacitance in the lead wires thus giving rapid response on the strain indicator.

The terminal boxes installed in 1958 were below grade which permitted water to accumulate in them. It was therefore necessary to raise them above grade during the summer. Capacitors were also connected across the dummy gages to balance out capacitance in the lead wires and to increase indicator response.

For the locations installed this spring, the temperature of the concrete at the time of pouring was recorded. Initial strain gage readings were taken within 3 hours after the pouring of the concrete. Readings were then taken every hour for the first 48 hours. After this period, readings were taken regularly throughout the remainder of the summer.

VI. DISCUSSION OF RESULTS

A. Continuously Reinforced Concrete Pavement

1. Section Type B7-2

This section of the concrete pavement is 2,648 feet long, 7 inches thick and reinforced with No. 8 intermediate grade, deformed steel bars at 15 inches on centers. The reinforcing comprises 0.784% of the cross-sectional area of the pavement.

Instrumentation was installed at Stations 364+00 and 357+00, referred to hereafter as Location I and Location II respectively. Both locations are discussed separately and then a comparison is made between the two locations.

(a) Location I

Concrete at this section was poured at 9 a.m. on September 30, 1958. Readings throughout the winter were recorded and reported in a previous thesis.(1) Readings were resumed this summer and are reported in this manuscript.

Of the 8 "SR-4" gages originally installed at the preformed crack, 5 are still functioning. The magnitude of the strains is not known because the steel has strained beyond the yield point. The sensitivity of the gages to strain is believed to be correct and reliable. All of the "SR-4" gages away from a crack are functioning properly. The capacitance of the lead wires varied slightly throughout the summer due to variations in the moisture content of the granular base. The change in capacitance caused some zero drift of the gages but the magnitude of this drift is believed to be small. Plate I-8 shows the location of "SR-4" gages in the test panel.

On Plate I-1 three time curves are plotted. The average slab temperature curve is the average of three thermocouples placed vertically above each other. One thermocouple is 1 inch from the top of the slab, the next thermocouple is at the centre of the slab and the third thermocouple is 1 inch from the bottom of the slab. The average slab temperature increased until the middle of July; then it began to decrease. The daily variation in temperature is seen to be approximately the same for all periods during which readings were taken.

The average crack width curve is a plot of the average of four sets of crack width pins (see Plate I-8). From this plot, it can be seen that the crack never did close completely. Straining of the steel beyond the yield point probably resulted in the crack remaining open. The crack closed to approximately the same limit during the hottest part of each afternoon even though the average slab temperature decreased considerably. It opened to greater widths with decreasing average slab temperature.

The strains recorded by the 5 "SR-4" gages at the crack were averaged to provide the values for the average strain at a crack curve. The absolute magnitude of the strain at the crack is not known but the relative magnitudes of the strain are correct and reliable. The magnitude of the strains and daily variation in the strains were at a minimum during the hottest part of the summer. The magnitude of the strains and range of daily variation in the strains increased with the decrease in the average slab temperature.

Plate I-2 has a repeat plot of the average slab temperature. Also shown is the average strain at gages 7 and 8. This is a typical

plot of the strain in the steel at points away from the crack. The minimum strain in the steel was recorded when the average slab temperature was highest. The magnitude of strains in the steel decreased with increasing average slab temperature and then increased when the average slab temperature began to decrease. The range of daily variation was approximately constant during all periods when readings were taken.

Plate I-3 shows the strain in the steel at various distances away from the crack. From the crack to some distance away from it, there is a region known as activated bond.(2) Activated bond starts at a crack and extends to the point where the strain in the steel and the strain in the concrete become equal. The point where the strains are equallized is the point at which the strain transfer curves become horizontal. The length of activated bond includes the portion of steel where bond is completely broken as well as the portion of steel where the strain is transferred from the steel to the concrete. The length of activated bond at this location is about 16 bar diameters.

The strain transfer curve for 481 days is erratic. Plate I-8 provides an explanation. A crack formed to the west of the preformed crack in the spring of 1959 and passed through several gages. Another crack formed in the fall of 1959 on the east side of the performed crack passing through several more gages. These cracks were tight during the summer but opened up with the low temperatures in the winter.

Plate I-4 is a plot of the average strain at a crack versus the slab temperature as measured by the thermocouple at the centre of the slab. The centre thermocouple gave a better correlation than did the average slab temperature because the latter is greatly influenced by

the temperature at the top of the slab. The plot indicates that a straight line relationship exists between the strain in the steel and the centre slab temperature.

A close examination of the plotted points will reveal the seasonal behavior of the pavement slab. The points for a particular period of readings all generally fall on one side of the plotted line. If a straight line were placed through these points, this line would be roughly parallel to the line describing the overall pavement behavior.

Plate I-5 is a plot of the average crack width versus the slab temperature as measured by the top thermocouple since this gave the best correlation. This means that the crack widths measured are for surface cracks and are considerably greater than the crack width at the middle of the slab.(6)

The curve consists of two definite straight lines. One straight line describes the influence of the temperature on the crack width when the two concrete surfaces of the crack are not in contact with each other. The other line describes the behavior of the crack when the concrete surfaces are in contact and the concrete is in compression at high slab temperatures. Seasonal variations can be observed upon close examination.

Plate I-6 is a plot of average crack width versus average steel strain at a crack. The curve is also two straight lines. One line describes the behavior for an open crack and the other describes the behavior for a closed crack. Steel strains continued to decrease even though the crack had closed to its limiting value. This is verified by the single straight line for the strain-temperature curve

of Plate I-4.

The foregoing discussion, with the accompanying Plates, seems to indicate a particular pattern of behavior for a continuously reinforced concrete pavement. At low slab temperatures, the crack is open with the result that steel strains at the crack and the crack width are a straight line function of temperature. As slab temperature increases, the crack will close to some limiting value generally showing some residual crack opening. The width of the open crack is a function of the amount of shrinkage, the yielding of steel reinforcing and the infiltration of foreign material. A further increase in slab temperature results in the compression of the concrete. Therefore, the crack width versus temperature curve has an entirely different slope after the crack has closed. The crack closed at a temperature of 77°F. Since slab temperatures were generally higher than this during the hot part of the summer, the closing of the crack offers an explanation as to why the daily variation in crack width and steel strain was least at this particular time of the year.

Since the steel at some distance away from a crack is perfectly bonded to the concrete, both materials must undergo the same length change. The strain in the steel at points away from a crack must therefore be a measure of the strain in the concrete at the same point.

The daily variation in strain for gages 7 and 8 shown in Plate I-2 is therefore the measure of daily variation in strain for the bonded concrete and steel.

The strain away from a crack decreased with an increase in average slab temperature (Plates I-2 and I-3). When the average slab temperature decreased, the strains began to increase. This change in the magnitude

of the strains is believed to be caused by the plastic flow of the concrete under sustained stress and not by the change in the average slab temperature. This is illustrated in the following paragraph.

Since the thermal coefficient for steel is generally greater than the thermal coefficient for concrete, an increase in the slab temperature will cause compression in the steel. If the coefficients are assumed to differ by 1×10^{-6} inches per inch per degree Fahrenheit then an increase of $10^{\circ}F$ in the average slab temperature from June 24 to July 14, should decrease the strain by 10 micro inches per inch. As can be seen from Plate I-3, the decrease was about 150 micro inches per inch near the crack and 100 micro inches per inch at the gaging point furthest away from the crack. Plastic flow relieves some of the strain at a crack.

Plate I-7 shows the crack spacing as of August 1959 within 100 feet on each side of the preformed crack. The effect of the preformed crack on the crack spacing can be clearly seen. The cracks are spaced at greater intervals near the preformed crack than at some distance away from the crack. The crack is therefore not typical of the average crack but rather of the worst crack possible. The susceptibility of the strains and crack widths to temperature is the same as at an average crack but the magnitude is much greater.

The effect of construction joints is also illustrated. More cracks formed in the concrete following the joint than in the concrete immediately preceding the construction joint. The concrete preceding the joint has a higher tensile strength than the concrete following the joint. Therefore shrinkage and length changes tend to be concentrated in the lower strength concrete causing cracks to form.

TIME CURVES

SECTION TYPE B7 – 2 LOCATION 1 STATION 364+00

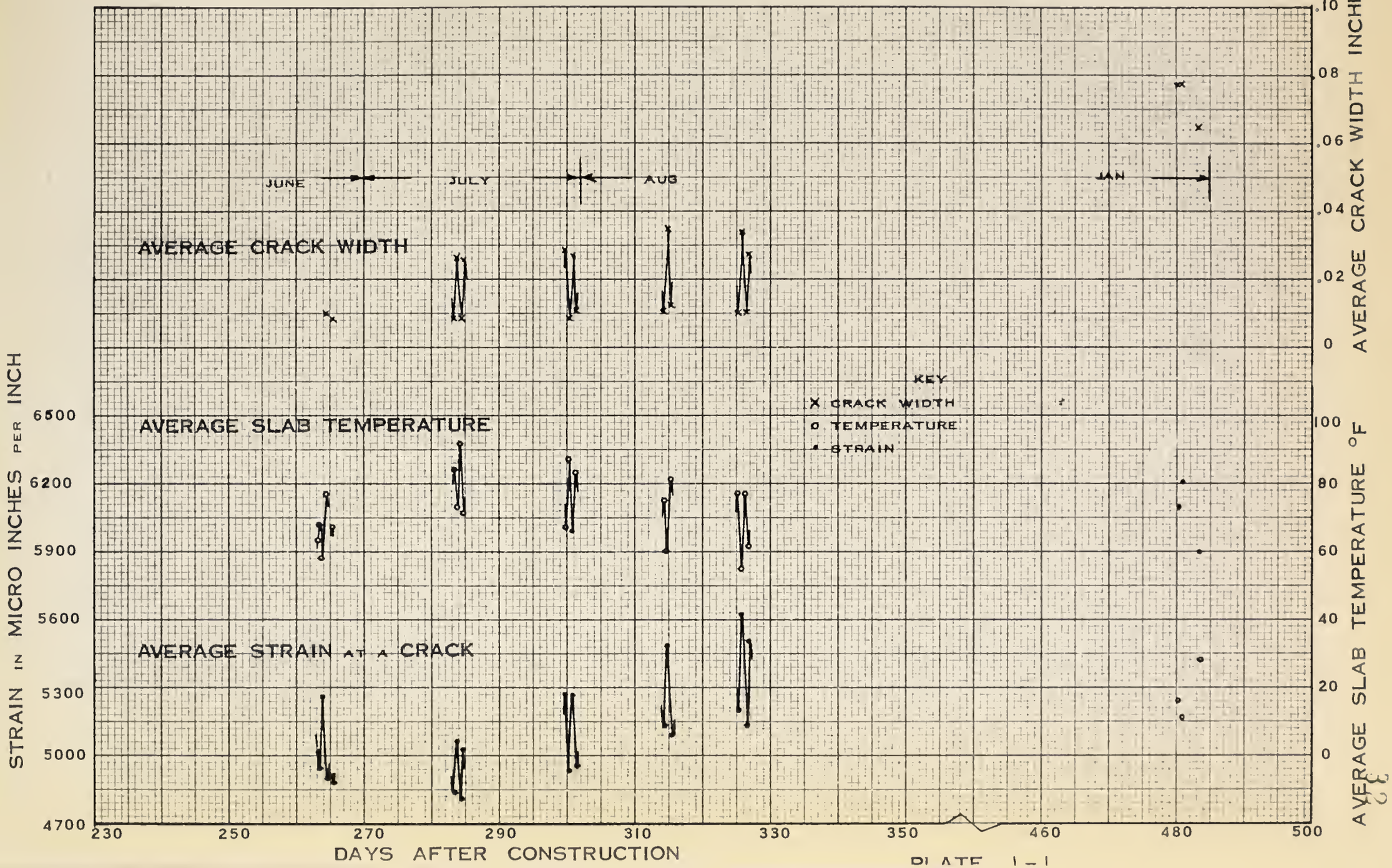


PLATE 1 – 1

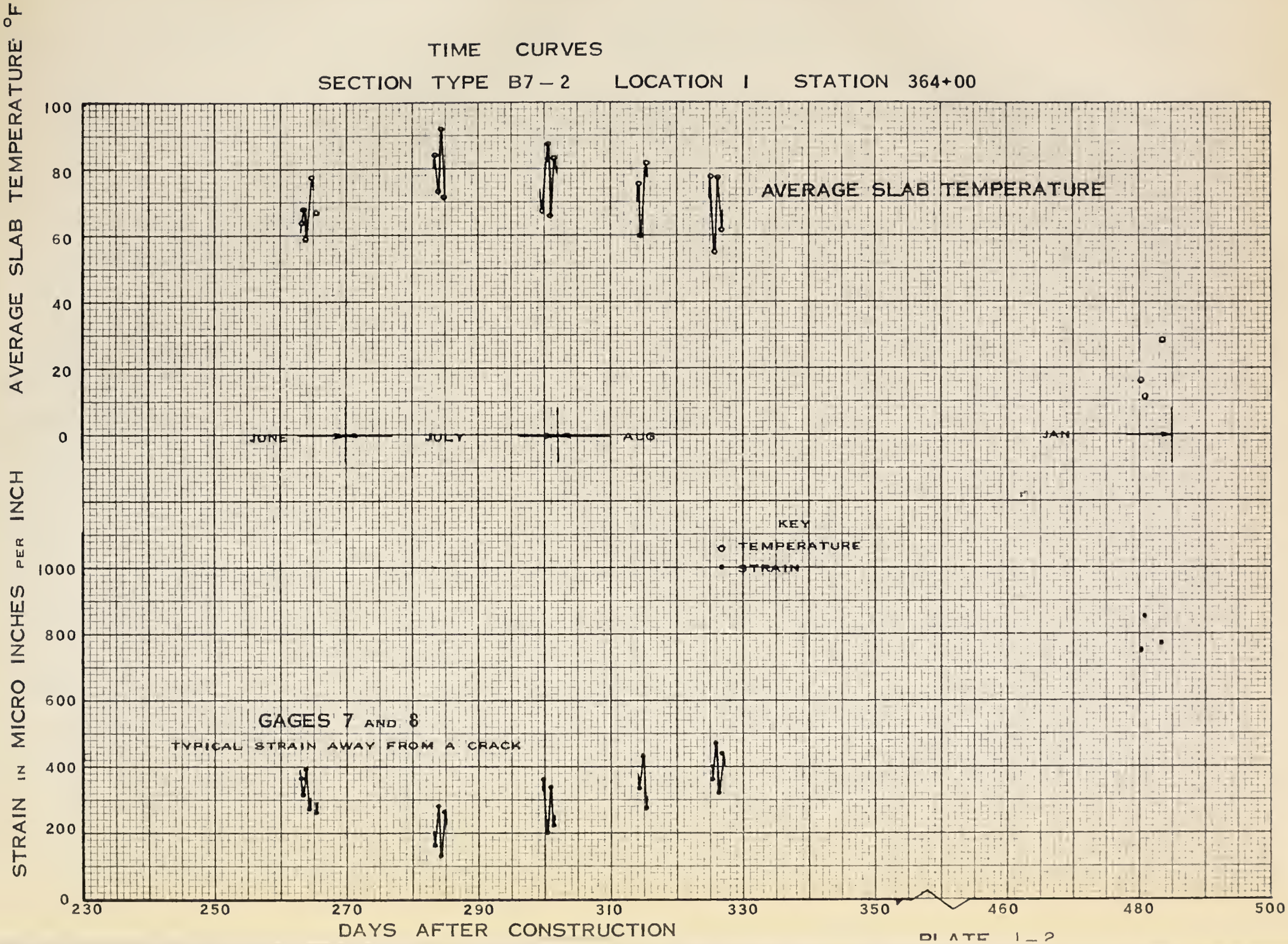

TIME CURVES
SECTION TYPE B7 – 2 LOCATION I STATION 364+00
AVERAGE SLAB TEMPERATURE °F
STRAIN IN MICRO INCHES PER INCH
AVERAGE SLAB TEMPERATURE
100
80
60
40
20
0
JUNE
JULY
AUG
JAN
KEY
TEMPERATURE
STRAIN
1000
800
600
400
200
0
GAGES 7 AND 8
TYPICAL STRAIN AWAY FROM A CRACK
230
250
270
290
310
330
350
460
480
500
DAYS AFTER CONSTRUCTION

PLATE I – 2

STRAIN TRANSFER CURVES

SECTION TYPE B7 – 2 LOCATION 1 STATION 364+00

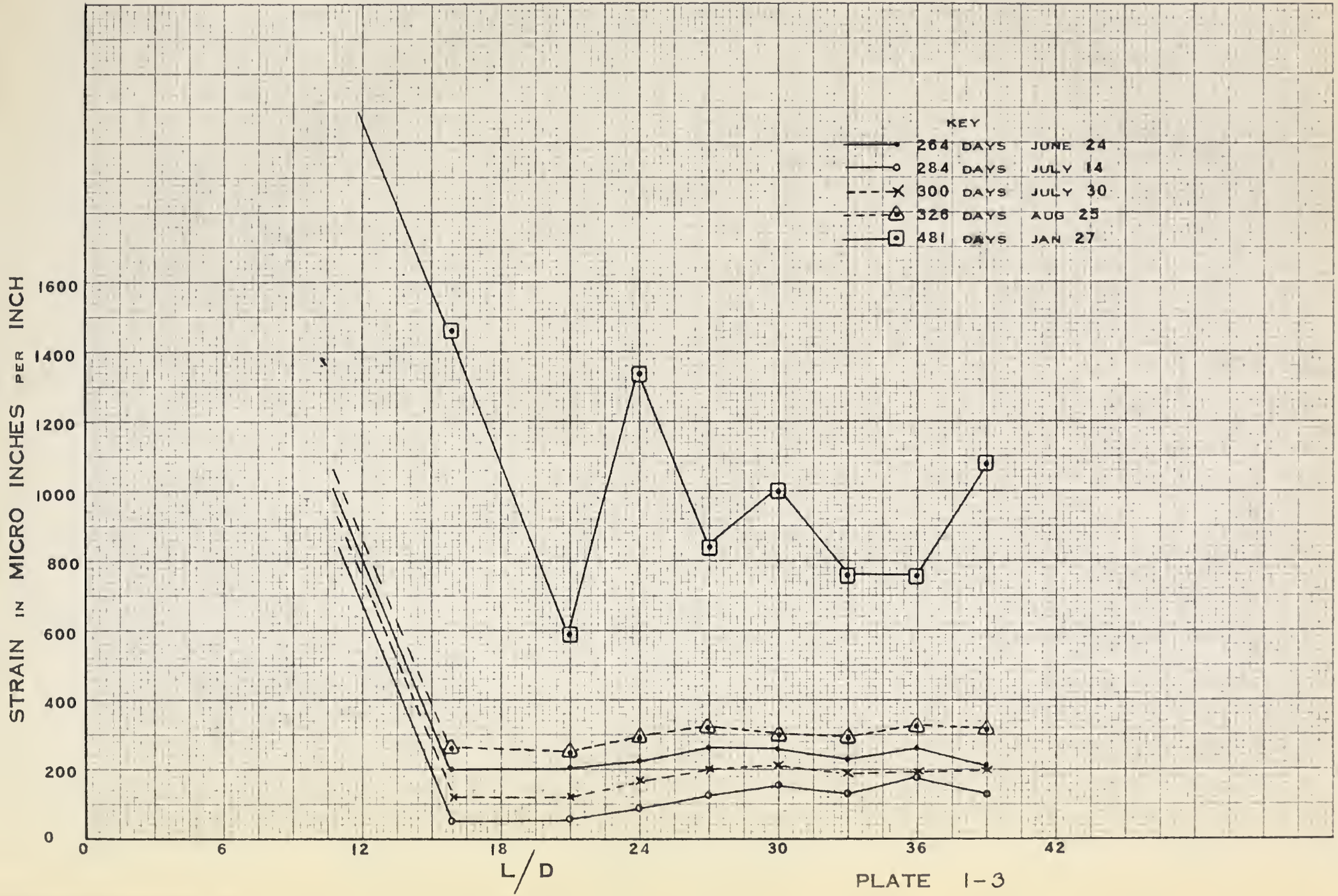


PLATE 1-3

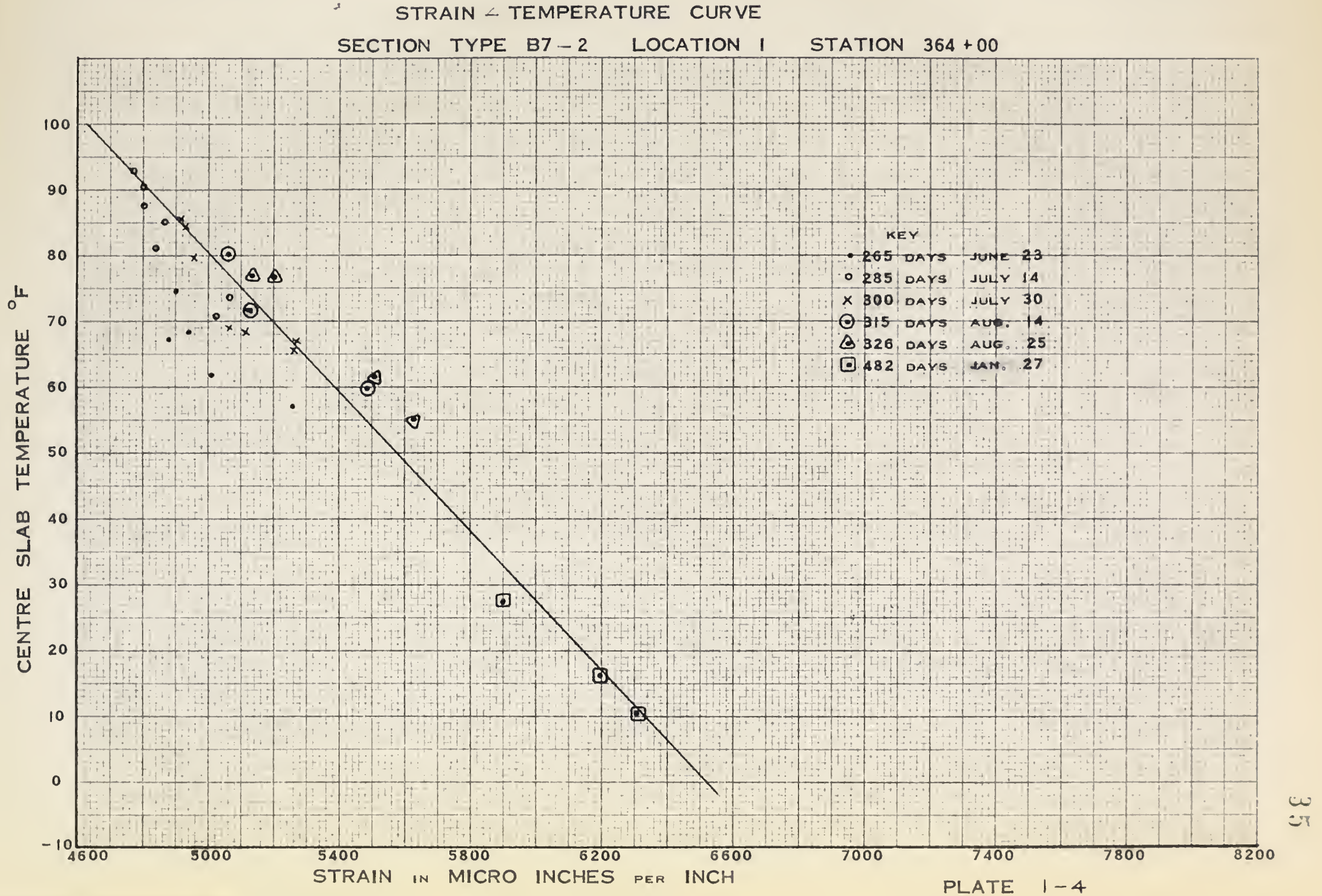

STRAIN ∠ TEMPERATURE CURVE
SECTION TYPE B7 – 2 LOCATION 1 STATION 364 + 00
CENTRE SLAB TEMPERATURE °F
100
90
80
70
60
50
40
30
20
10
0
– 10
4600
5000
5400
5800
6200
6600
7000
7400
7800
8200
STRAIN IN MICRO INCHES PER INCH
KEY
• 265 DAYS JUNE 23
o 285 DAYS JULY 14
× 300 DAYS JULY 30
⊙ 315 DAYS AUG. 14
△ 326 DAYS AUG. 25
⊡ 482 DAYS JAN. 27

PLATE 1 – 4

CRACK WIDTH – TEMPERATURE CURVE

SECTION TYPE B7 – 2 LOCATION 1 STATION 364+00

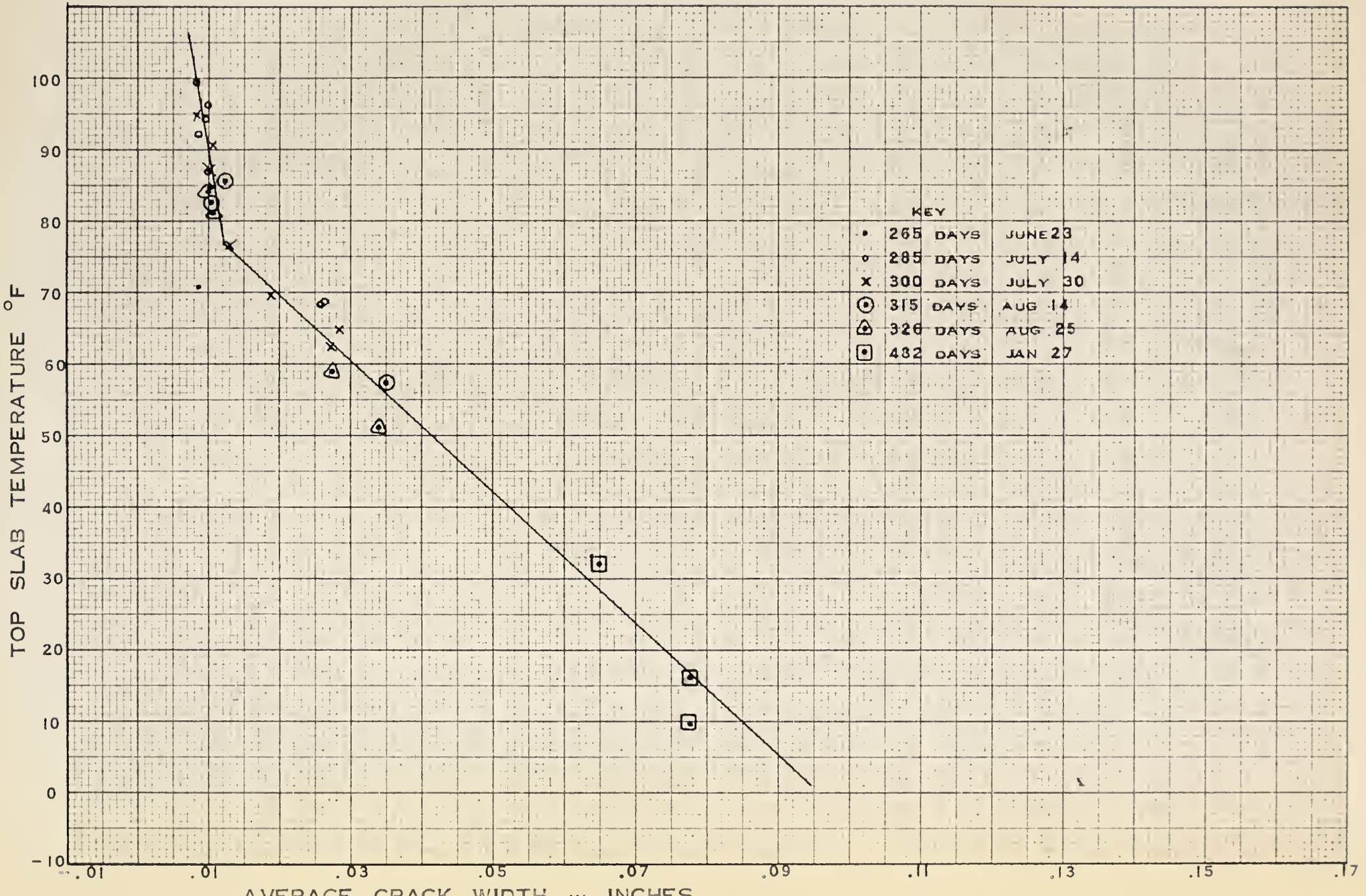


PLATE I-5

STEEL STRAIN – CRACK WIDTH CURVE

SECTION TYPE B7 – 2 LOCATION 1 STATION 364+00

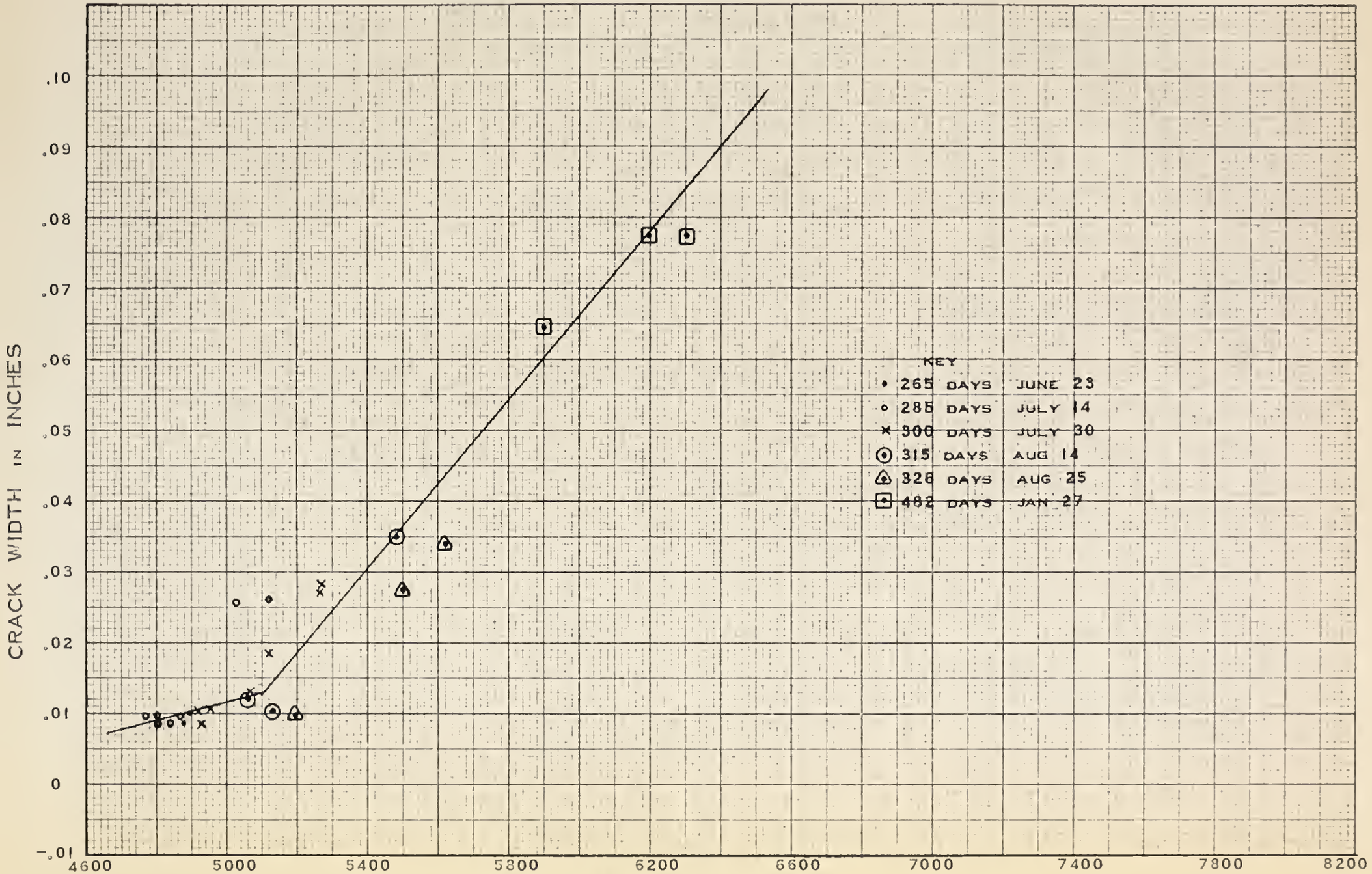
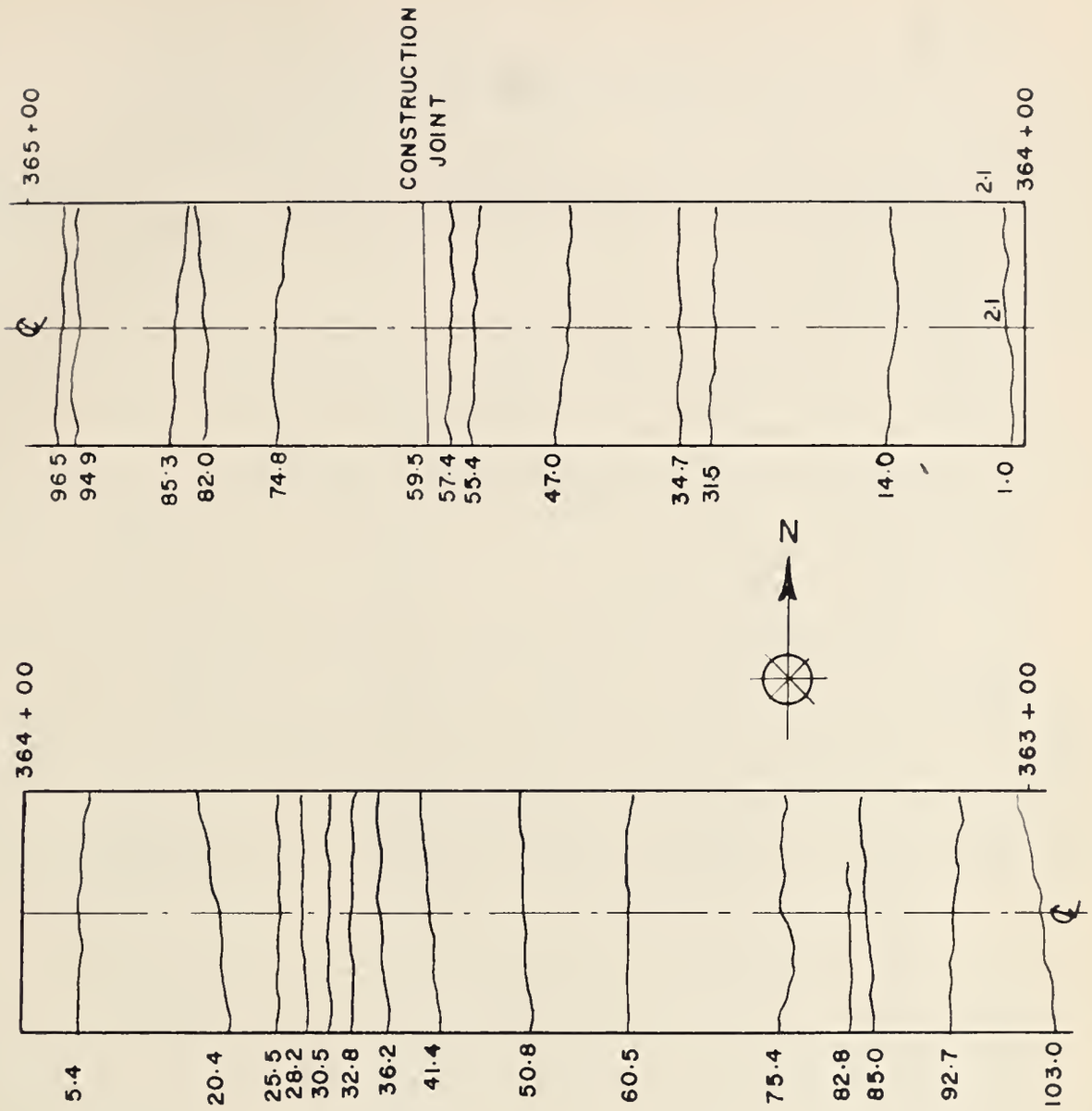


PLATE 1-6



SCALE 1" = 20'
LOCATION 1
STATION 364 +00
TYPE B7 - 2

CRACK SPACING

PLATE 1-7

GAGE POSITIONS

SECTION TYPE B7-2 LOCATION 1 STATION 364+00

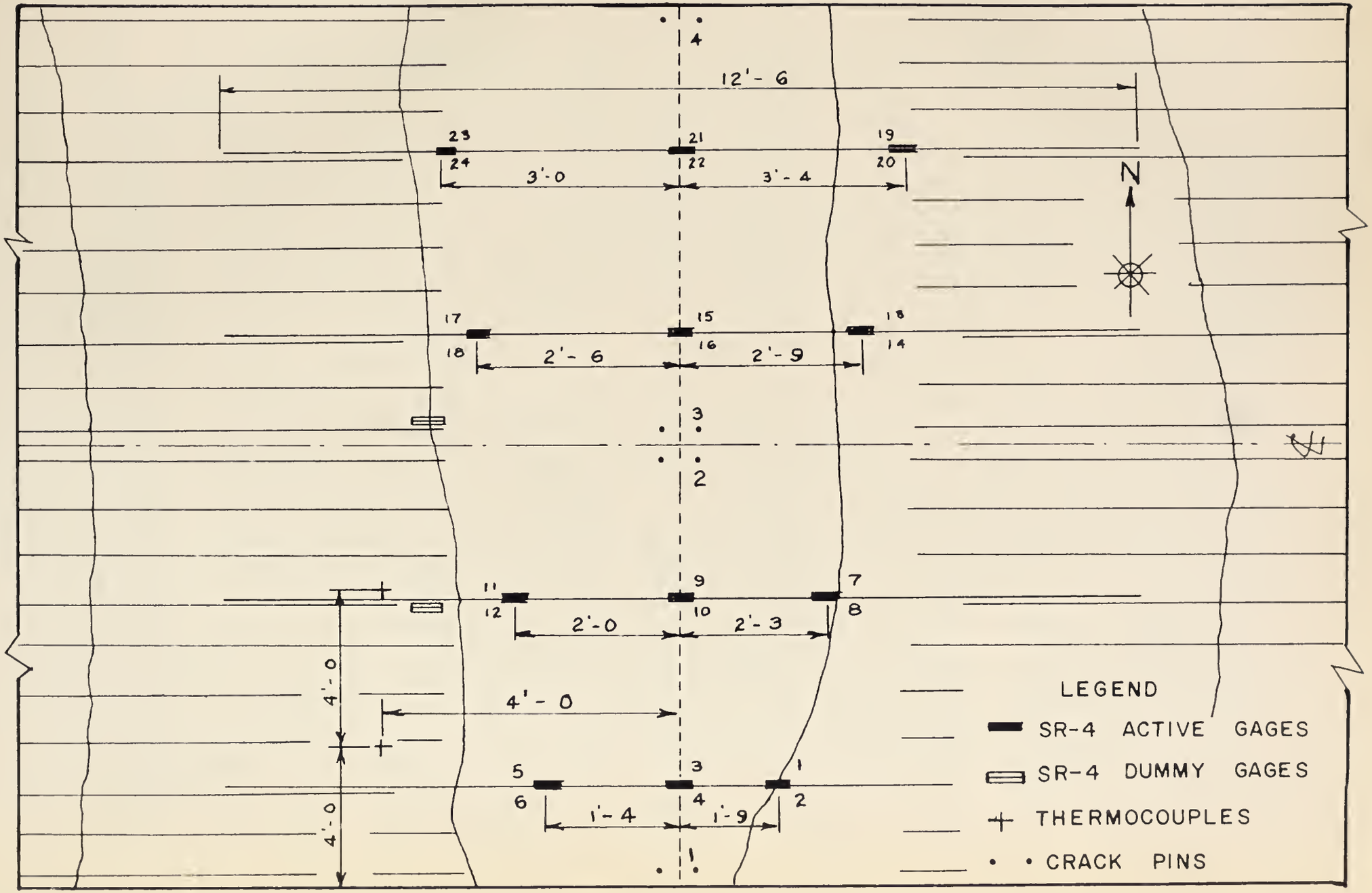


PLATE 1-8

(b) Location II

Concrete was poured at 11 a.m. on October 1, 1958. Three of the 8 gages at the crack are still functioning. Two of the gages away from the crack were disconnected because of low resistance to ground. The gages at the crack indicate that the steel had strained beyond the yield point and therefore the absolute magnitude of the strains is unreliable. The relative magnitudes are dependable. Zero drift of the gages did occur to a small extent. Plate 2-8 shows the location of gages in the test panel.

Three time curves are plotted on Plate 2-1. The average slab temperature curve is the average of readings from three thermocouples. The range of daily temperature variation was approximately constant for all periods during which readings were recorded. The highest slab temperature was recorded in July of 1959.

The average crack width curve is a plot of the average measurements from 4 sets of crack width pins. Plate 2-5 is a plot of the average crack widths versus the top slab temperature. Both curves show that the crack did not close completely but rather it reached a limiting value. The crack reached this limiting value at a temperature of 74° F. When the slab temperature increased above 74°F, the concrete on each side of the crack was compressed. The compression of concrete also explains why daily crack width variations were smaller for the same daily temperature variations during the hottest part of the year than daily temperature variations at any other time of year.

The average strain at a crack is the average of the readings provided by the 3 gages at the crack. The magnitude of the strains

was least when the average slab temperature was at a maximum. Daily variations in strains was least during July probably due to the compression of concrete during the hot part of the day.

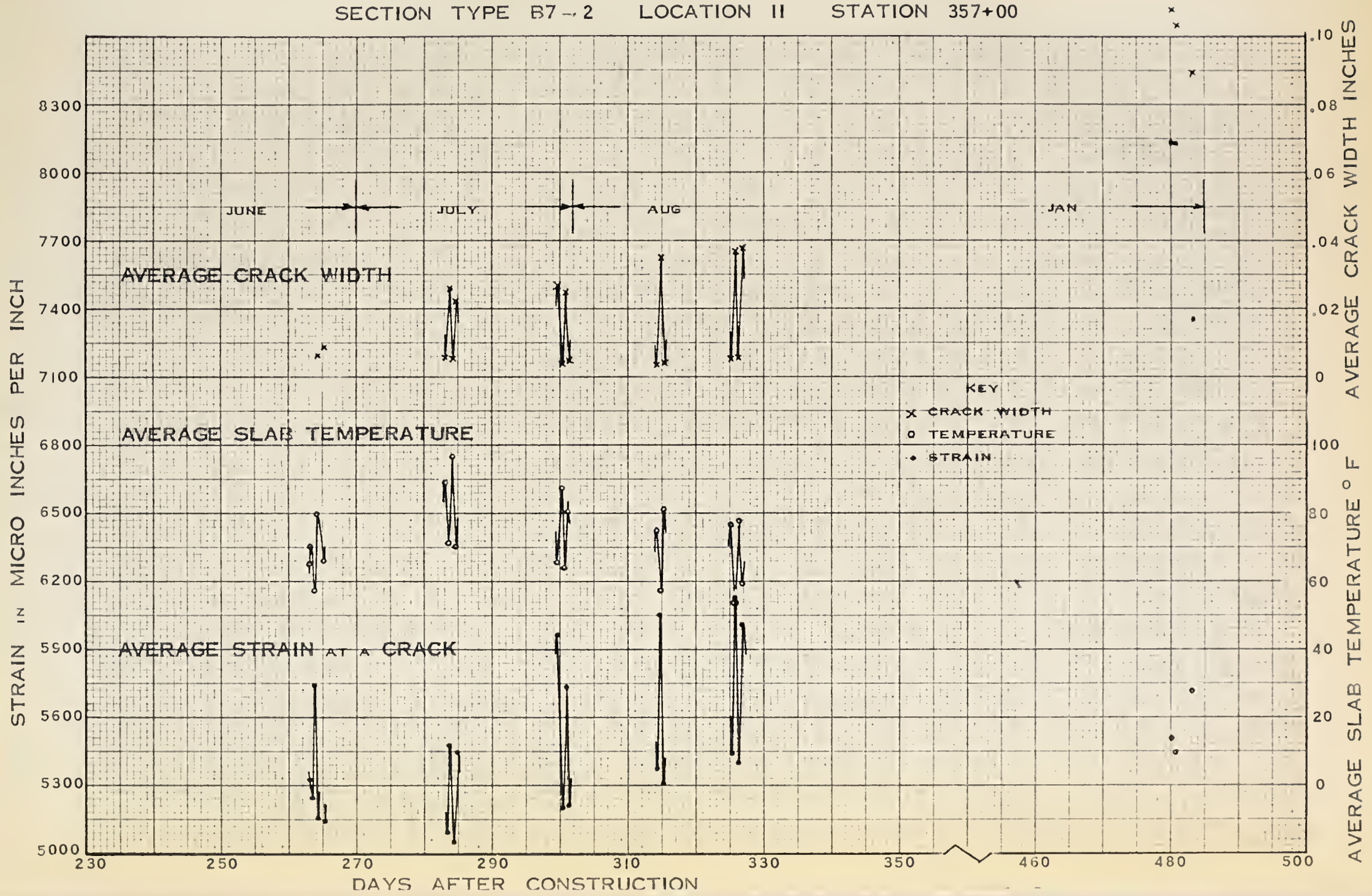
Plate 2-4 shows that the relationship between steel strain at a crack and the centre slab temperature is a straight line. Seasonal variations are noticeable.

Plotted on Plate 2-2 is the average strain recorded by gages 7 and 8. This strain is typical of steel strain at points away from a crack. The daily variation in strain is approximately constant throughout the entire period during which readings were obtained.

The strain transfer curves on Plate 2-3, along with preceding Plate 2-2 illustrate the amount of plastic flow that occured. Activated bond extended to a distance of 27 bar diameters away from the crack.

The steel strain-crack width curve on Plate 2-6 is best defined by a single straight line. Seasonal variation can be easily seen.

Plate 2-7 shows the spacing of cracks within 100 feet of each side of the preformed crack. There is a larger distance between cracks near the preformed crack than at some distance away from the crack. Two new cracks, one on each side of the preformed crack, formed in the fall of 1959 (see Plate 2-8). The formation of these cracks did not seem to affect the magnitude of the strains and crack widths at the preformed crack.


TIME CURVES
SECTION TYPE B7 – 2 LOCATION II STATION 357+00
JUNE
JULY
AUG
JAN
AVERAGE CRACK WIDTH
AVERAGE SLAB TEMPERATURE
AVERAGE STRAIN AT A CRACK
KEY
X CRACK WIDTH
o TEMPERATURE
• STRAIN
STRAIN IN MICRO INCHES PER INCH
8300
8000
7700
7400
7100
6800
6500
6200
5900
5600
5300
5000
AVERAGE CRACK WIDTH INCHES
.10
.08
.06
.04
.02
0
AVERAGE SLAB TEMPERATURE ° F
100
80
60
40
20
0
230
250
270
290
310
330
350
460
480
500
DAYS AFTER CONSTRUCTION

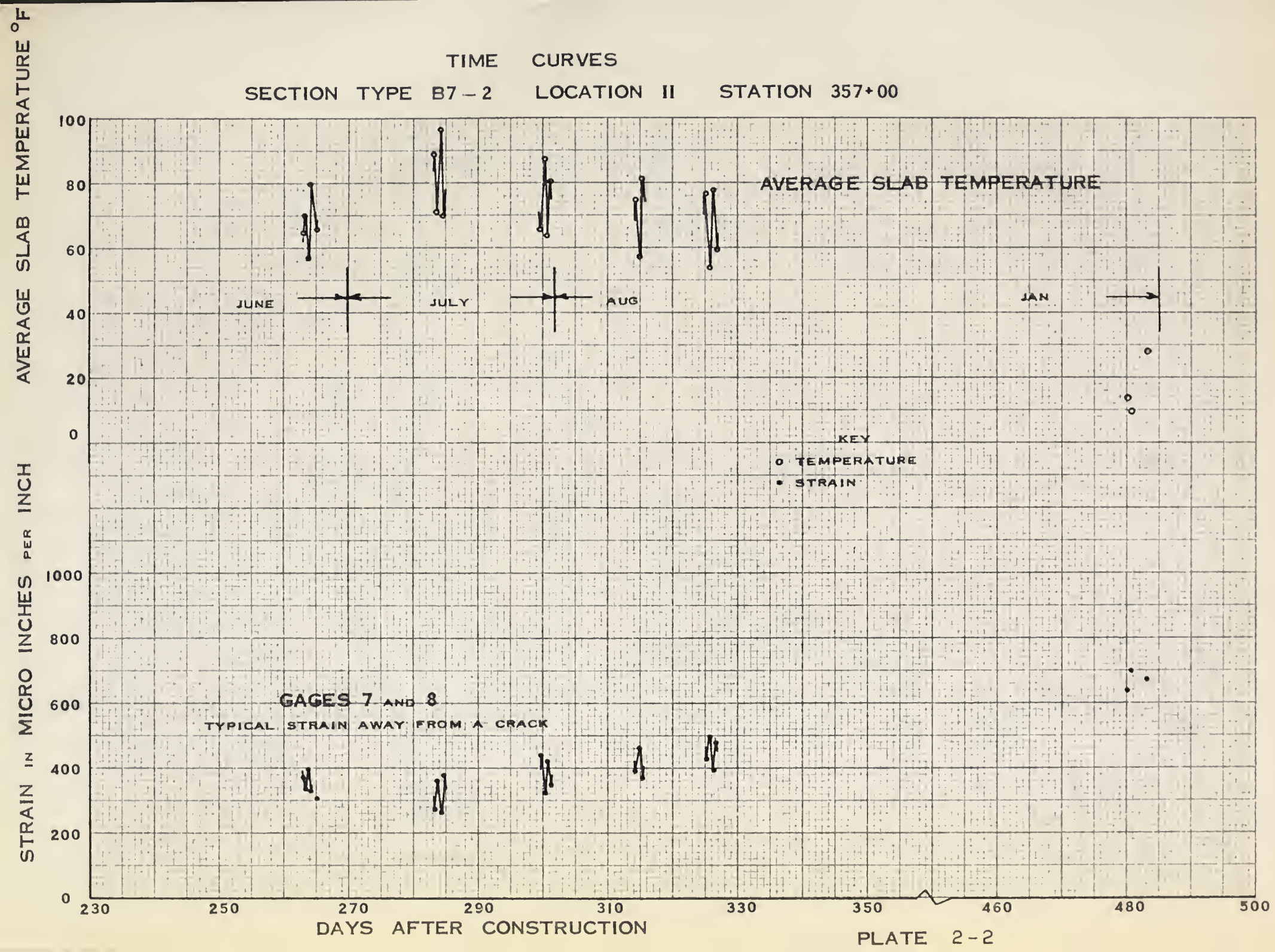

TIME CURVES
SECTION TYPE B7 – 2 LOCATION II STATION 357+00
AVERAGE SLAB TEMPERATURE
JUNE
JULY
AUG
JAN
KEY
o TEMPERATURE
• STRAIN
GAGES 7 AND 8
TYPICAL STRAIN AWAY FROM A CRACK
AVERAGE SLAB TEMPERATURE °F
STRAIN IN MICRO INCHES PER INCH
100
80
60
40
20
0
1000
800
600
400
200
0
230
250
270
290
310
330
350
460
480
500
DAYS AFTER CONSTRUCTION

PLATE 2-2

STRAIN TRANSFER CURVES

SECTION TYPE B7 – 2 LOCATION II STATION 357+00

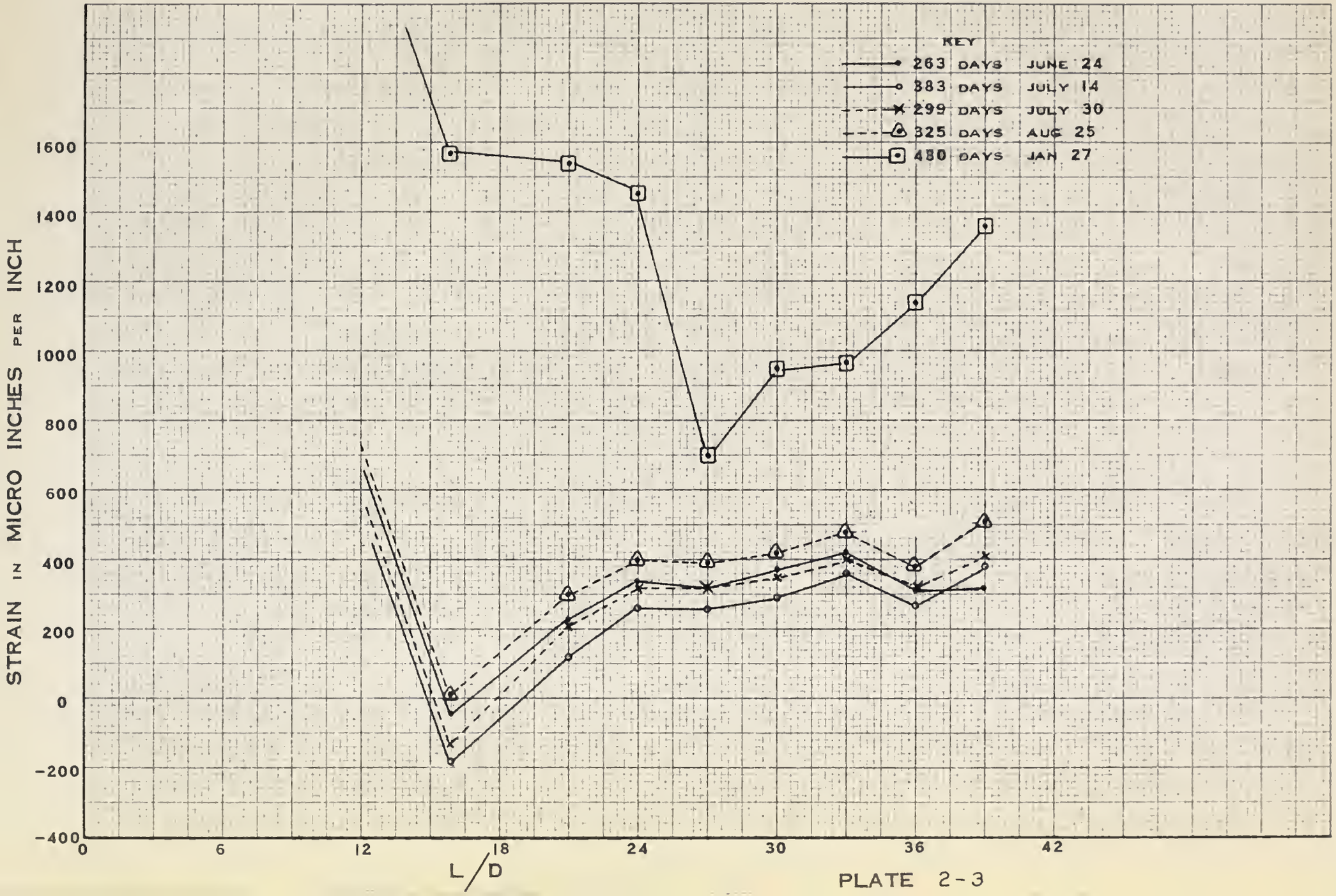
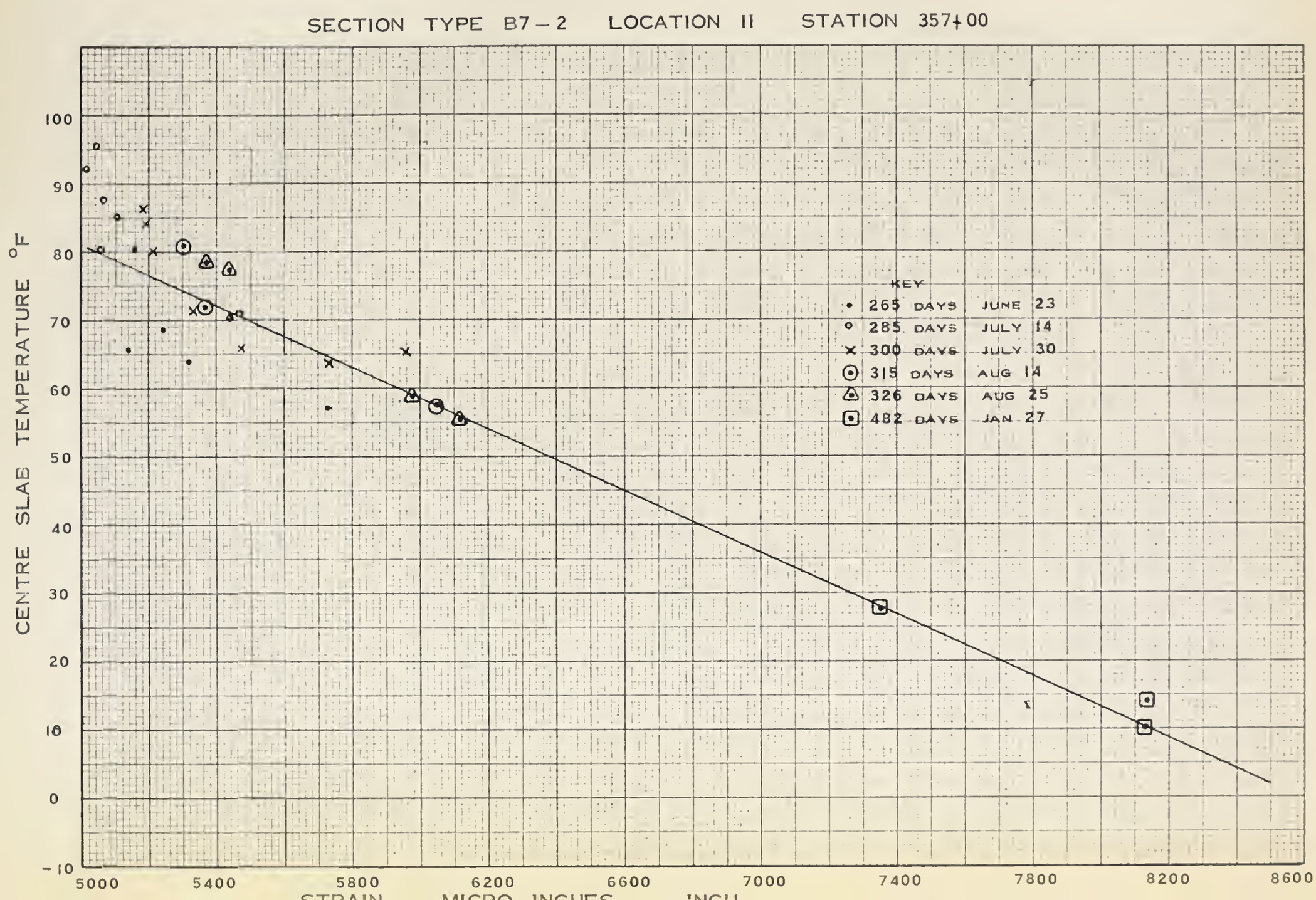


PLATE 2-3


STRAIN – TEMPERATURE CURVE
SECTION TYPE B7 – 2 LOCATION II STATION 357+00
CENTRE SLAB TEMPERATURE °F
100
90
80
70
60
50
40
30
20
10
0
-10
5000
5400
5800
6200
6600
7000
7400
7800
8200
8600
KEY
265 DAYS JUNE 23
285 DAYS JULY 14
300 DAYS JULY 30
315 DAYS AUG 14
326 DAYS AUG 25
482 DAYS JAN 27

CRACK WIDTH -- TEMPERATURE CURVE

SECTION TYPE B7 – 2 LOCATION II STATION 357+00

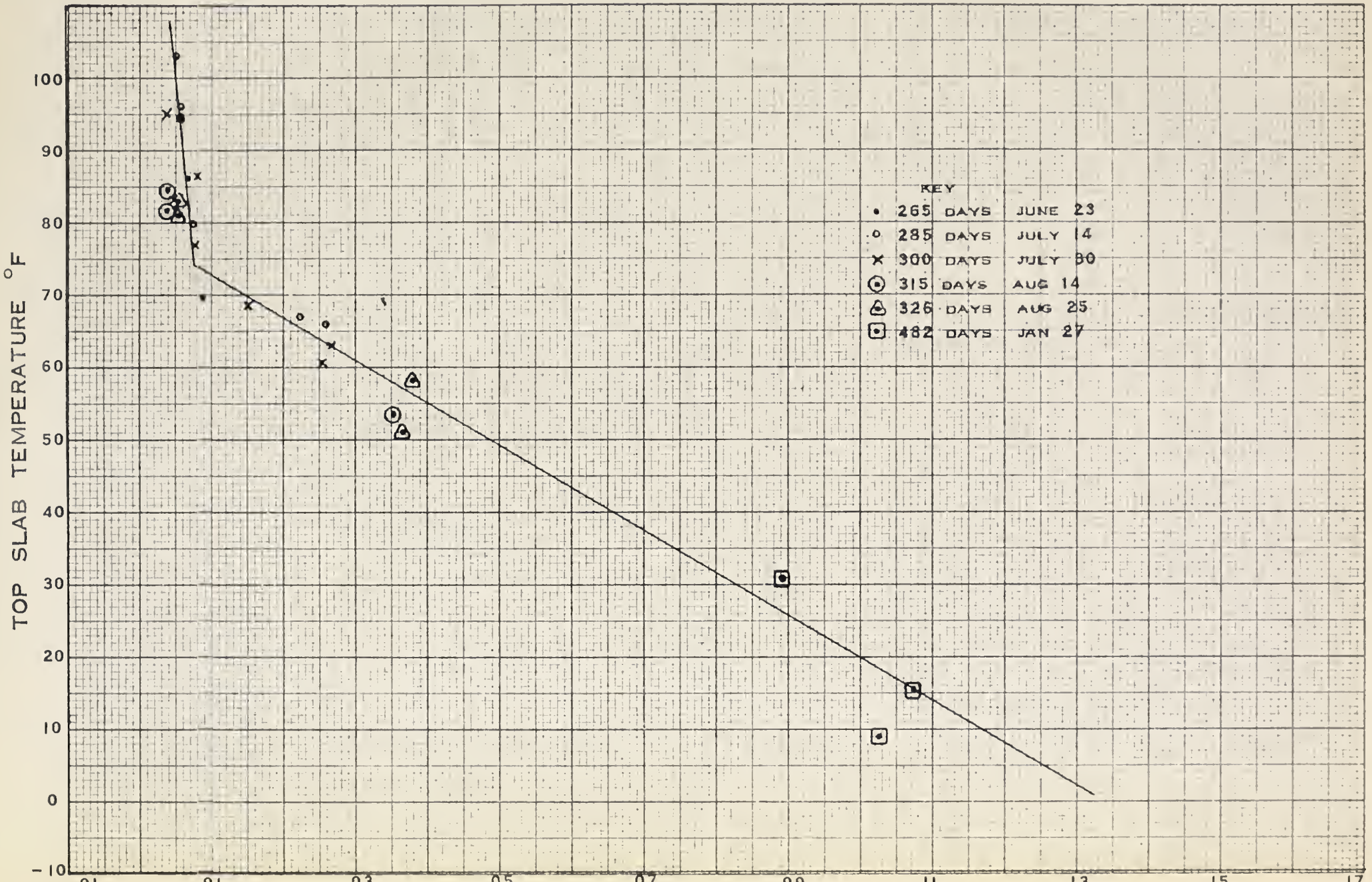


PLATE 2-5

STEEL STRAIN – CRACK WIDTH CURVE

SECTION TYPE B7 – 2 LOCATION II STATION 357+00

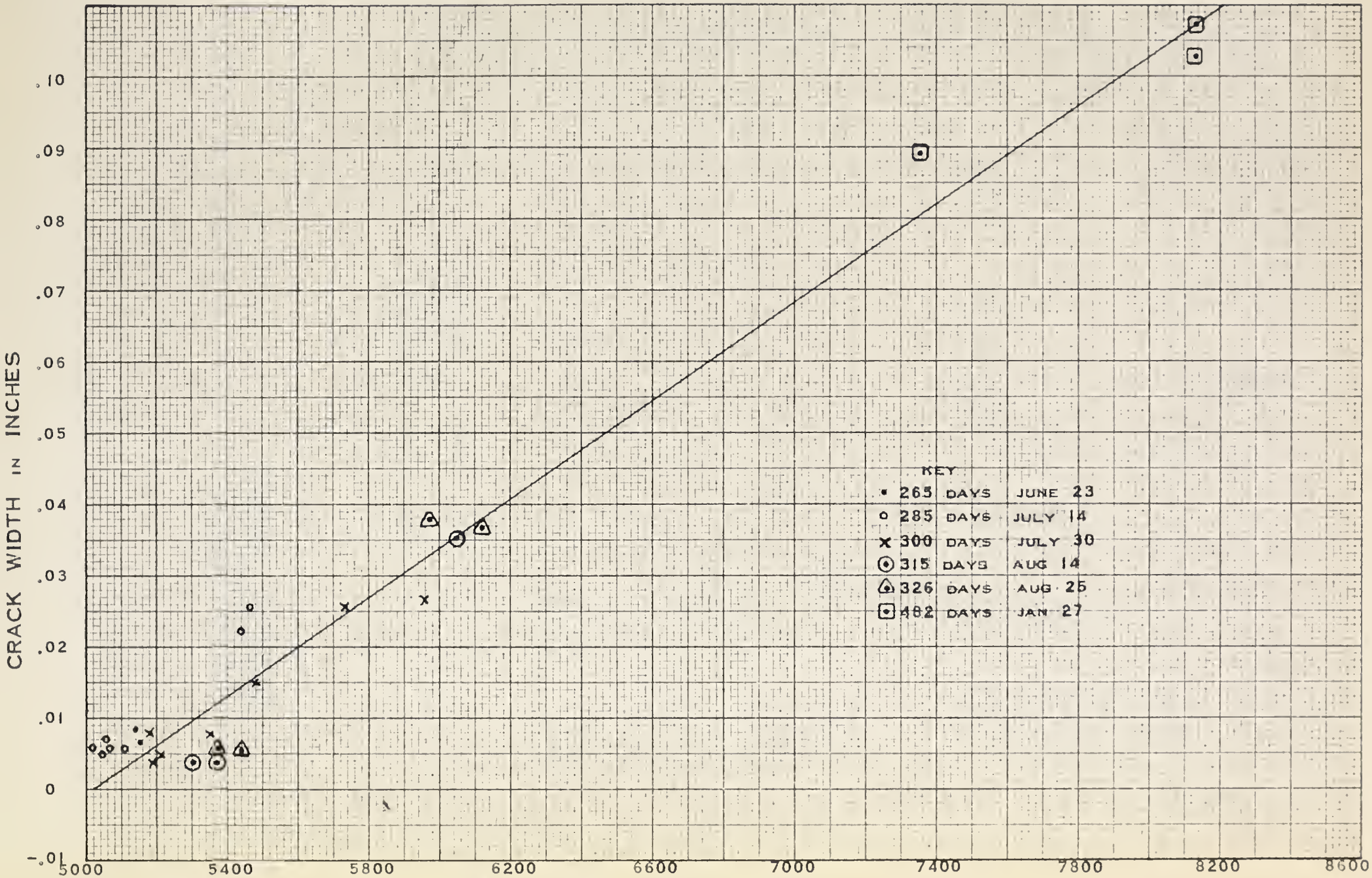
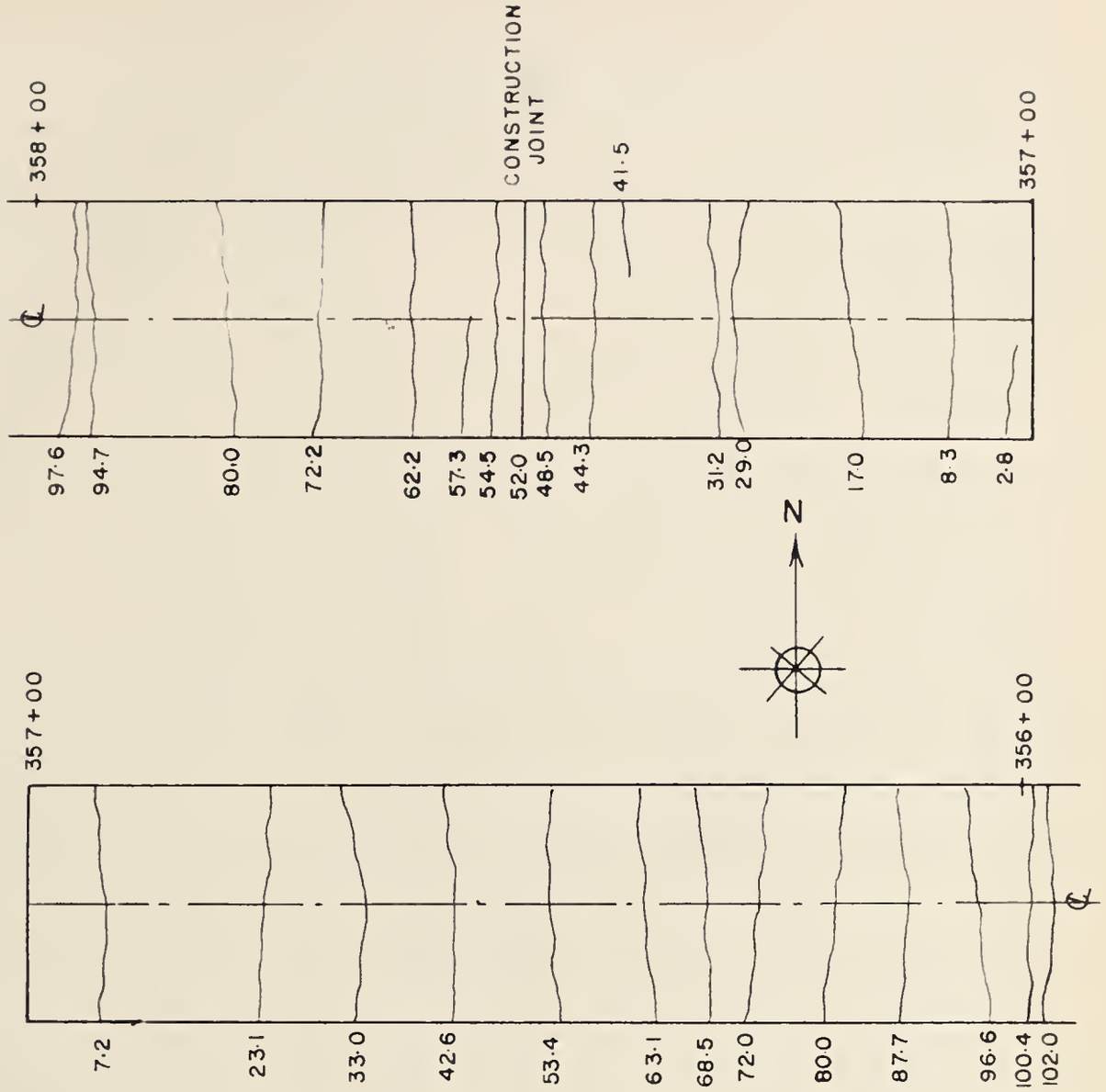


PLATE 2-6



SCALE 1"= 20'
LOCATION 11
STATION 357 + 00
TYPE B7-2

CRACK SPACING

PLATE 2-7

GAGE POSITIONS

SECTION TYPE B7-2 LOCATION 11 STATION 357 + 00

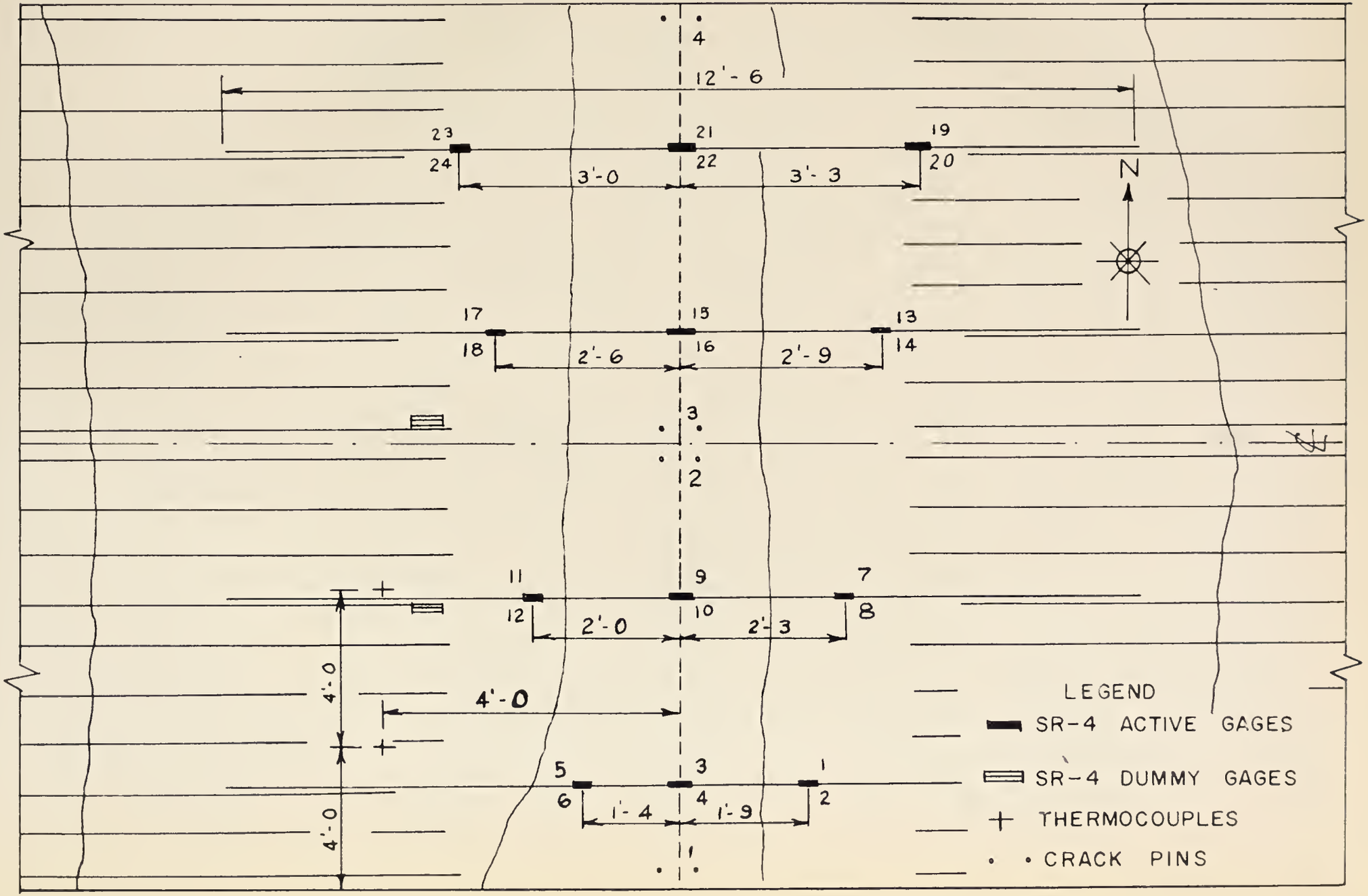


PLATE 2-8

(c) Comparison of Locations I and II

Both locations showed the same general behavior, but there are some differences when particular aspects of behavior are considered.

The crack opened to a greater extent at Location II than at Location I. The magnitude of the steel strains at the crack was also greater. The susceptibility at Location II was greater than at Location I. Susceptibility may be defined as either the slope of the steel strain versus temperature curve or the slope of the crack width versus temperature curve. It denotes the rate of response of the steel strain at a crack and the crack width to the influence of temperature. The daily variation in strain away from a crack was about 100 micro inches per inch at Location I.

The distance to the nearest crack was greater at Location II than at Location I. Also the length of activated bond at Location II is about 27 bar diameters whereas the length of activated bond at Location I is about 16 bar diameters. This is an explanation of why the crack opened to a greater extent at Location II.

Larger crack spacing and less strain in the bonded concrete and steel at Location II, appear to be the reasons for the larger magnitude of steel strains at the crack at Location II.

2. Section Type B7-1

The B7-1 type of pavement is 2645 feet long, 7 inches thick and reinforced with No. 8 intermediate grade, deformed steel bars at 16 inches on centers. The reinforcing comprises 0.706% of the cross-sectional area of the pavement.

There is only one instrumented panel located at Station 334+00 and in future referred to as Location III. The concrete was poured on October 6, 1958 at 4 p.m.

Four out of 8 gages at the crack are still functioning properly. Five gages away from the crack were disconnected leaving 11 intact. The set of crack width pins at the centre line was inside the range of the "Soiltest" gage used to measure crack widths so that only 2 sets of crack width pins were used.

One of the gaged bars did not yield at the crack while the other 3 bars did yield. Plate 3-8 shows the location of the cracks nearest to the preformed crack. The preformed crack passed through gages 15 and 16 while the nearest shrinkage crack passed through gages 17 and 18. Considering the length of bar required for the application of water proofing, only a short length of steel remained for the development of bond between the two cracks. Since the bond stress was high, the bond probably broke giving a long length of steel to take up the straining at the cracks. As a result the steel did not yield.

Since the other bars strained beyond the yield point, the absolute magnitude of strain is not accurate. The relative magnitudes are reliable.

Three time curves are plotted on Plate 3-1. The average slab temperature curve is the average of 3 thermocouples. The highest average slab temperature was recorded during July. The range of daily variations was approximately constant for all periods when readings were taken.

The average crack width curve is best discussed in conjunction with the crack width temperature curve on Plate 3-5. From both plots, it can be seen that the crack closed completely at a temperature of 70°F. When the average slab temperature was higher than 70°F, the concrete was in compression. Complete closure of the crack at 70°F is an explanation of the smaller daily variations in crack width for July as compared to other periods.

The average strain at a crack is the average strain as recorded by the 5 functioning "SR-4" gages. The lowest magnitude of strain was recorded simultaneously with the highest average slab temperature. The range of daily variation increased with decreasing average slab temperature.

The strain temperature curve on Plate 3-4 shows the relation between the steel strain and the centre slab temperature. A change in slope occurs at 72°F. Since the crack closed completely at this temperature, the concrete assisted the steel in carrying the temperature imposed strain.

Plate 3-2 has a plot of the average strain as recorded by gages 7 and 8. This strain is typical of the strain in the steel at points away from a crack. The range of daily variation shows a slight decrease with a decrease in the average slab temperature. Plastic flow is evident on this plot as well as on the strain transfer curves plotted on Plate 3-3.

The length of activated bond extended to a distance of about 24 bar diameters away from the crack.

Seasonal variations are evident on Plates 3-4, 3-5 and 3-6.

The steel strain crack width curve on Plate 3-6 consists of two straight lines. The strain at which the change in slope occurs is the same magnitude as the strain (Plate 3-4) when the crack closed completely.

Plate 3-7 shows the crack spacing within 100 feet on each side of the preformed crack. The survey was taken in August, 1959. The preformed crack seems to have had very little influence on the cracking pattern.

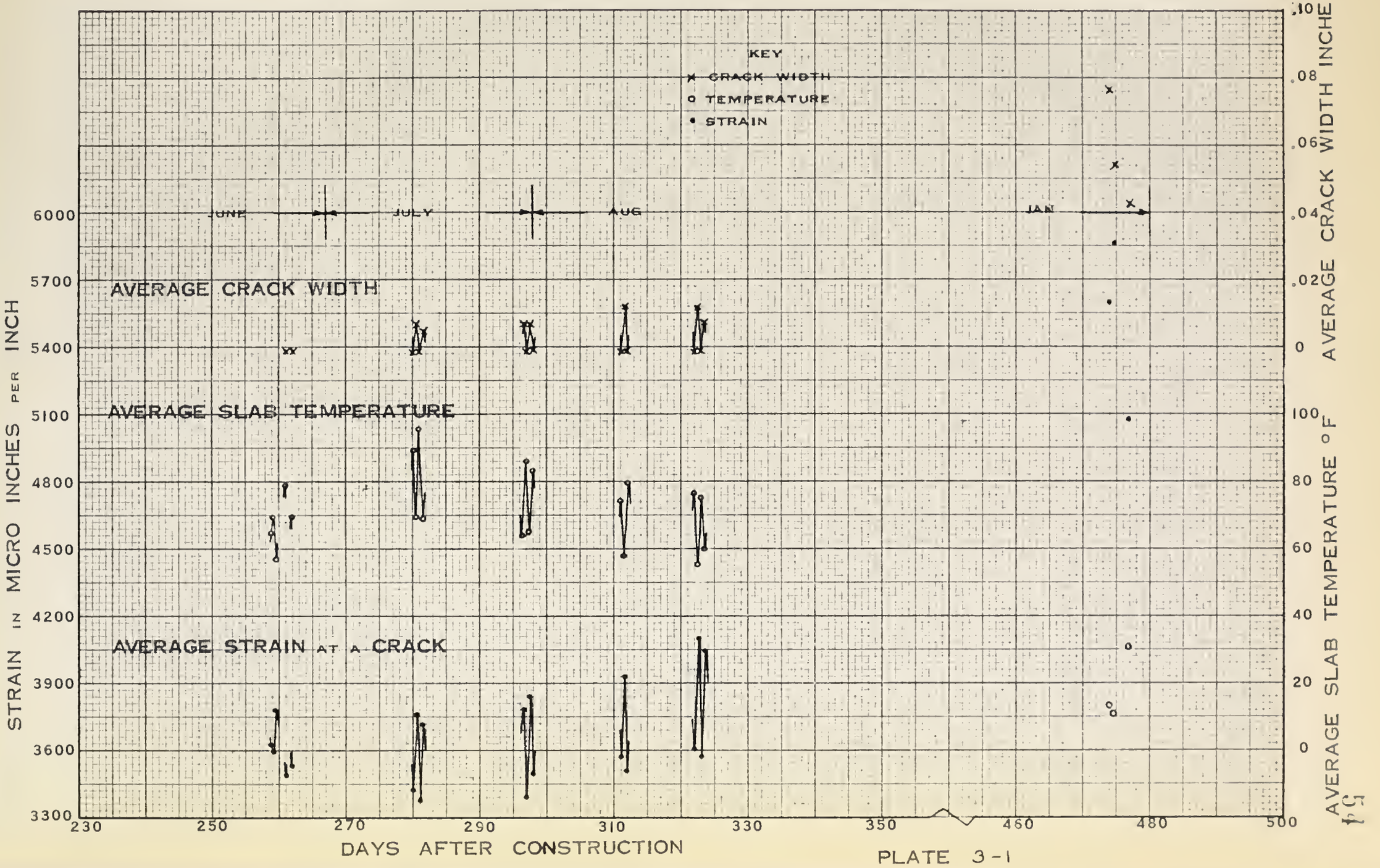
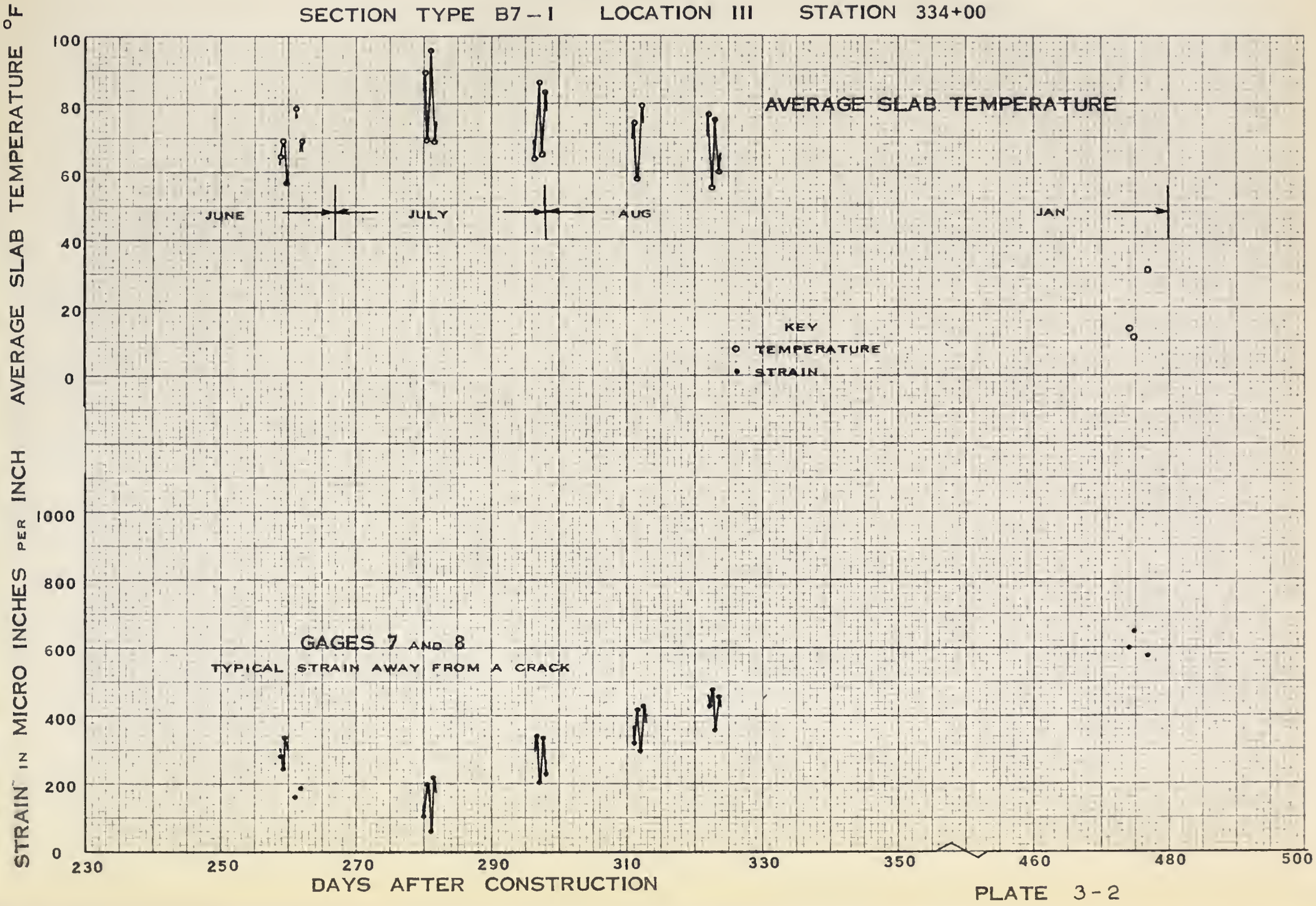

TIME CURVES
SECTION TYPE B7 – 1 LOCATION III STATION 334+00
KEY
X CRACK WIDTH
o TEMPERATURE
• STRAIN
JUNE
JULY
AUG
JAN
AVERAGE CRACK WIDTH
AVERAGE SLAB TEMPERATURE
AVERAGE STRAIN AT A CRACK
STRAIN IN MICRO INCHES PER INCH
6000
5700
5400
5100
4800
4500
4200
3900
3600
3300
AVERAGE CRACK WIDTH INCHES
.10
.08
.06
.04
.02
0
AVERAGE SLAB TEMPERATURE °F
100
80
60
40
20
0
230
250
270
290
310
330
350
460
480
500
DAYS AFTER CONSTRUCTION

PLATE 3-1


TIME CURVES
SECTION TYPE B7 – 1 LOCATION III STATION 334+00
AVERAGE SLAB TEMPERATURE °F
STRAIN IN MICRO INCHES PER INCH
100
80
60
40
20
0
1000
800
600
400
200
0
AVERAGE SLAB TEMPERATURE
JUNE
JULY
AUG
JAN
KEY
TEMPERATURE
STRAIN
GAGES 7 AND 8
TYPICAL STRAIN AWAY FROM A CRACK
230
250
270
290
310
330
350
460
480
500
DAYS AFTER CONSTRUCTION
PLATE 3-2

STRAIN TRANSFER CURVES

SECTION TYPE B7 – I LOCATION III STATION 334+00

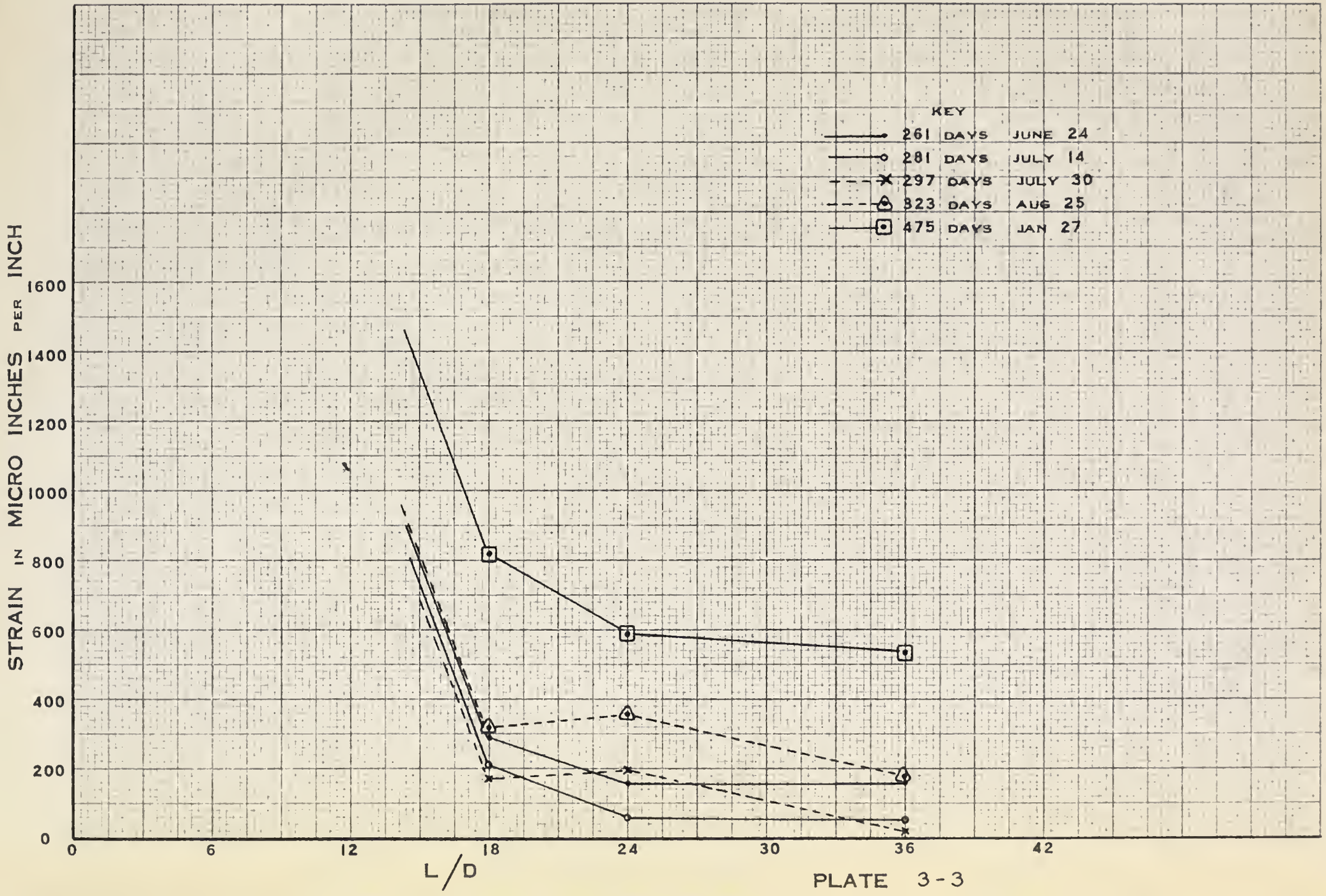


PLATE 3-3

STRAIN – TEMPERATURE CURVE

SECTION TYPE B7 – I LOCATION III STATION 334+00

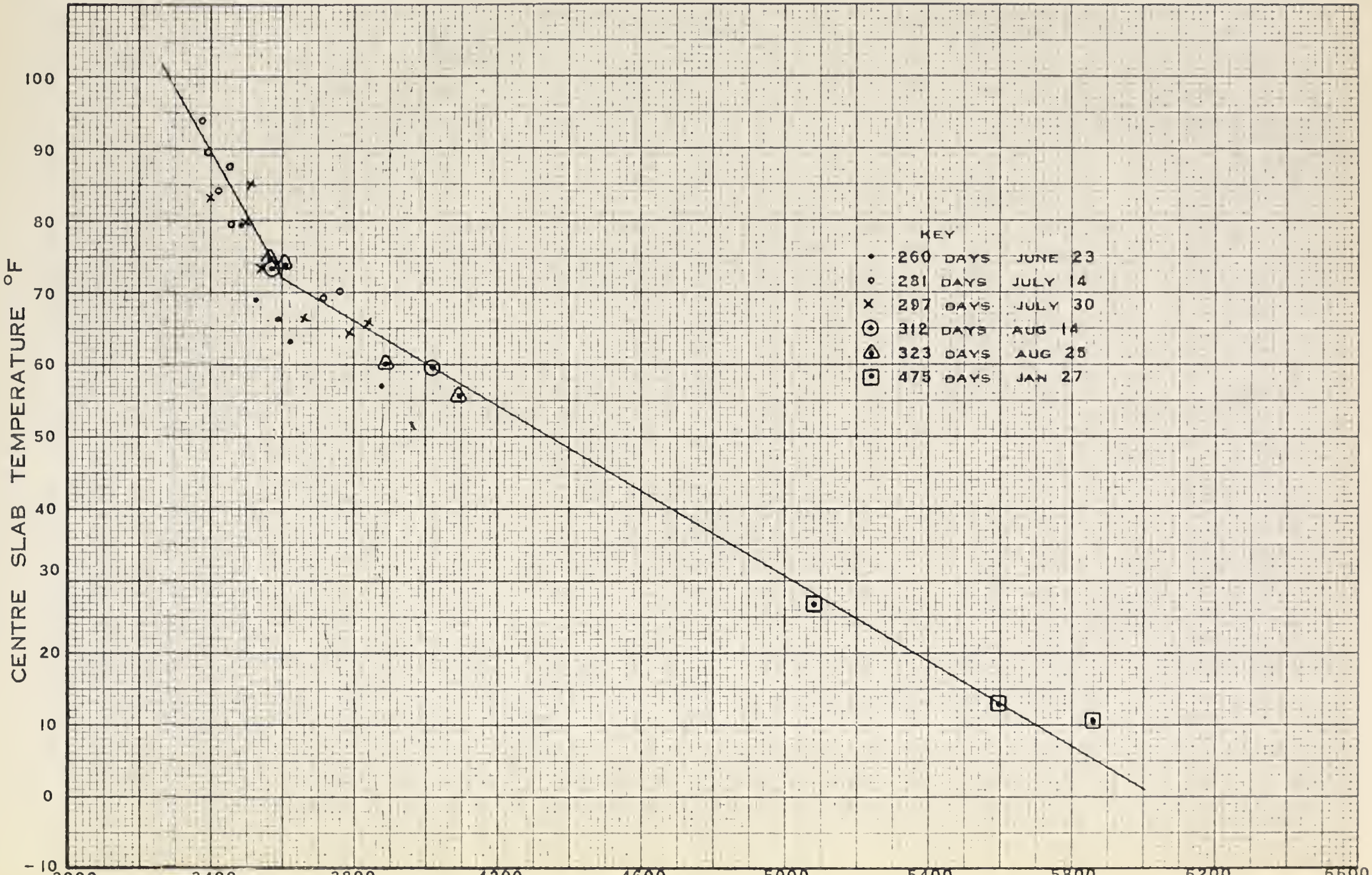


PLATE 3-4

CRACK WIDTH – TEMPERATURE CURVE

SECTION TYPE B7 – 1 LOCATION III STATION 334+00

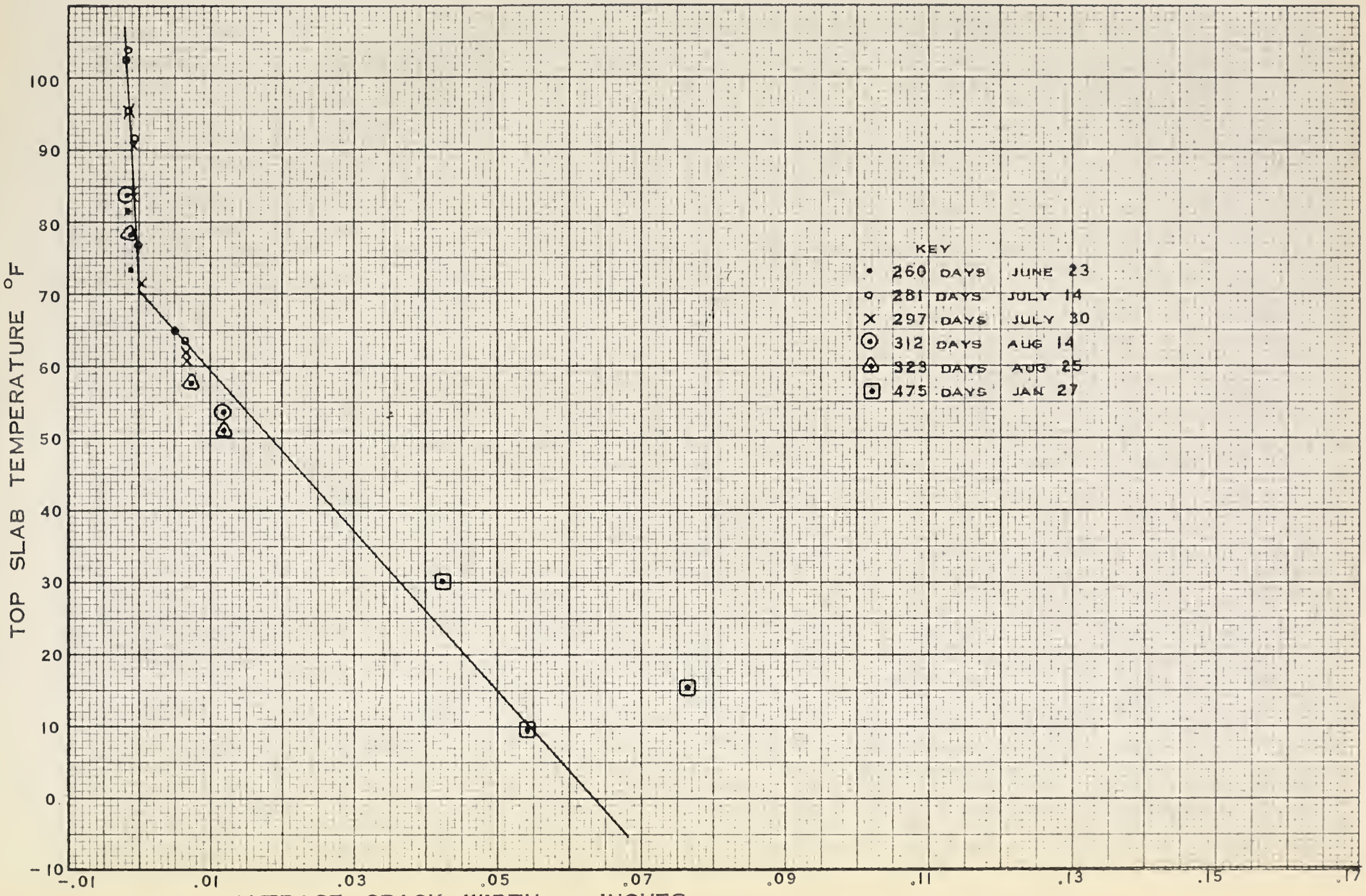


PLATE 3-5

STEEL STRAIN – CRACK WIDTH CURVE

SECTION TYPE B7 – I LOCATION III STATION 334+00

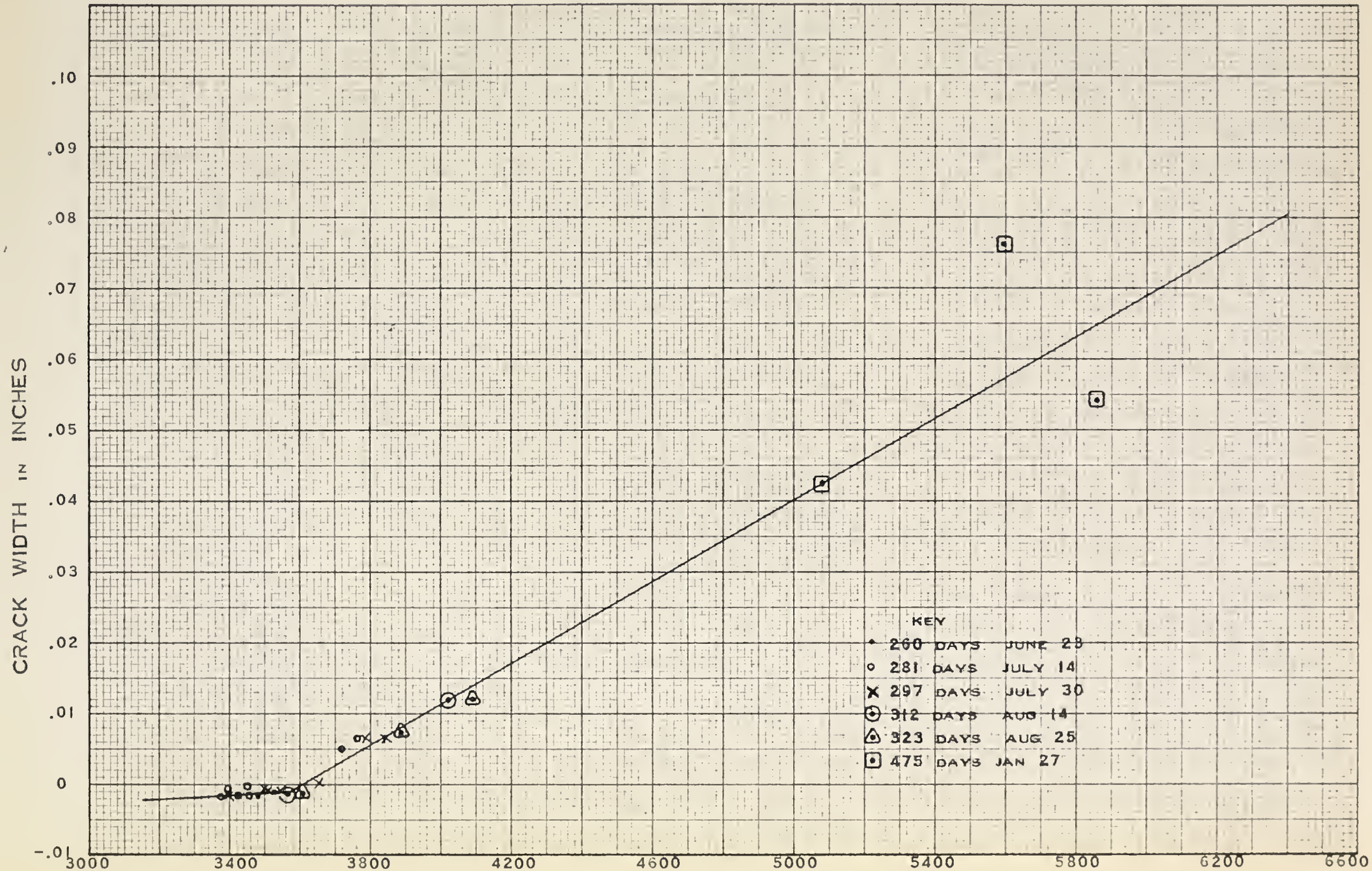
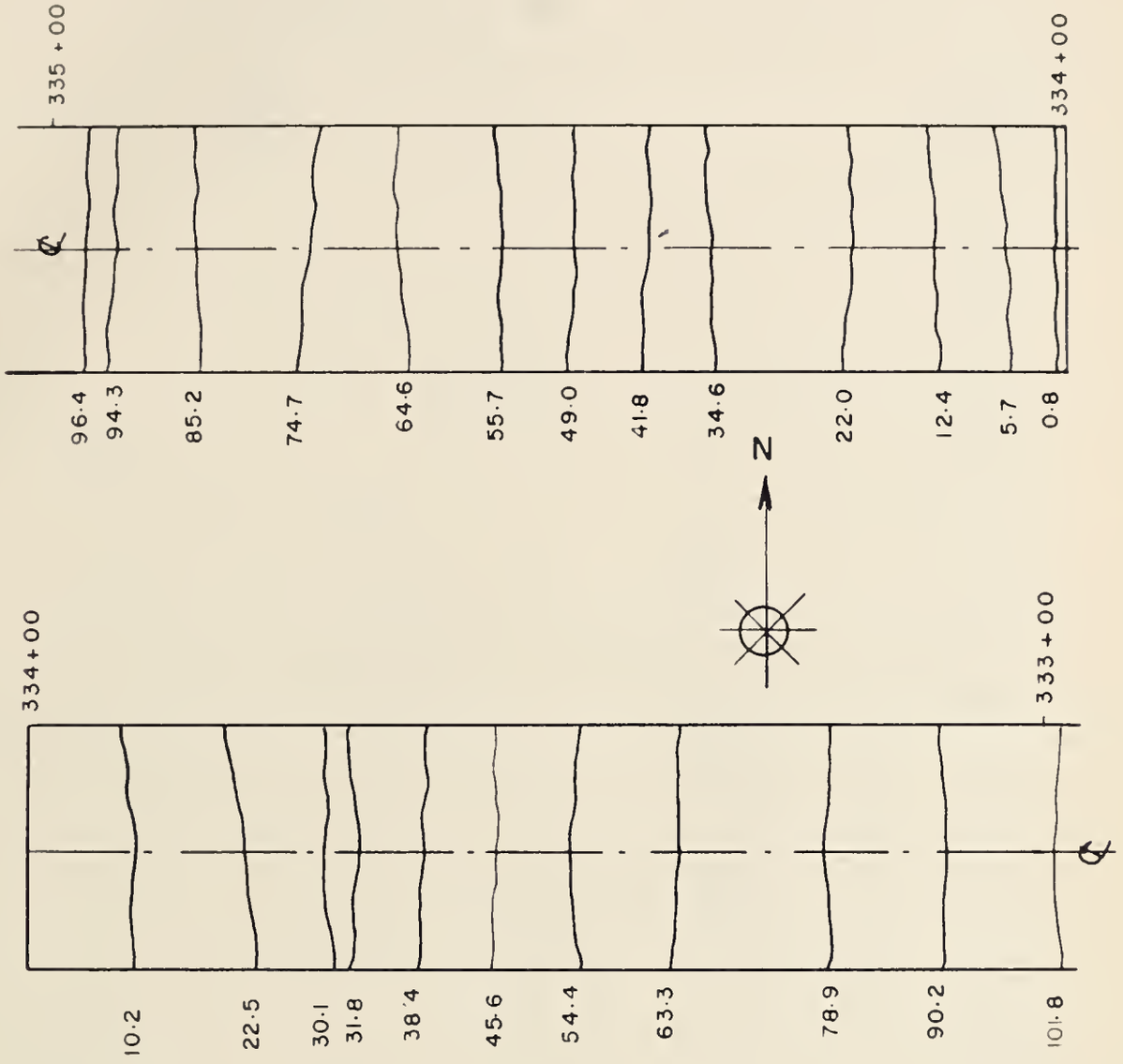


PLATE 3-6



SCALE 1" = 20'
LOCATION III
STATION 334+00
TYPE B7-1

CRACK SPACING

PLATE 3-7

GAGE POSITIONS

SECTION TYPE B7-I LOCATION III STATION 334+00

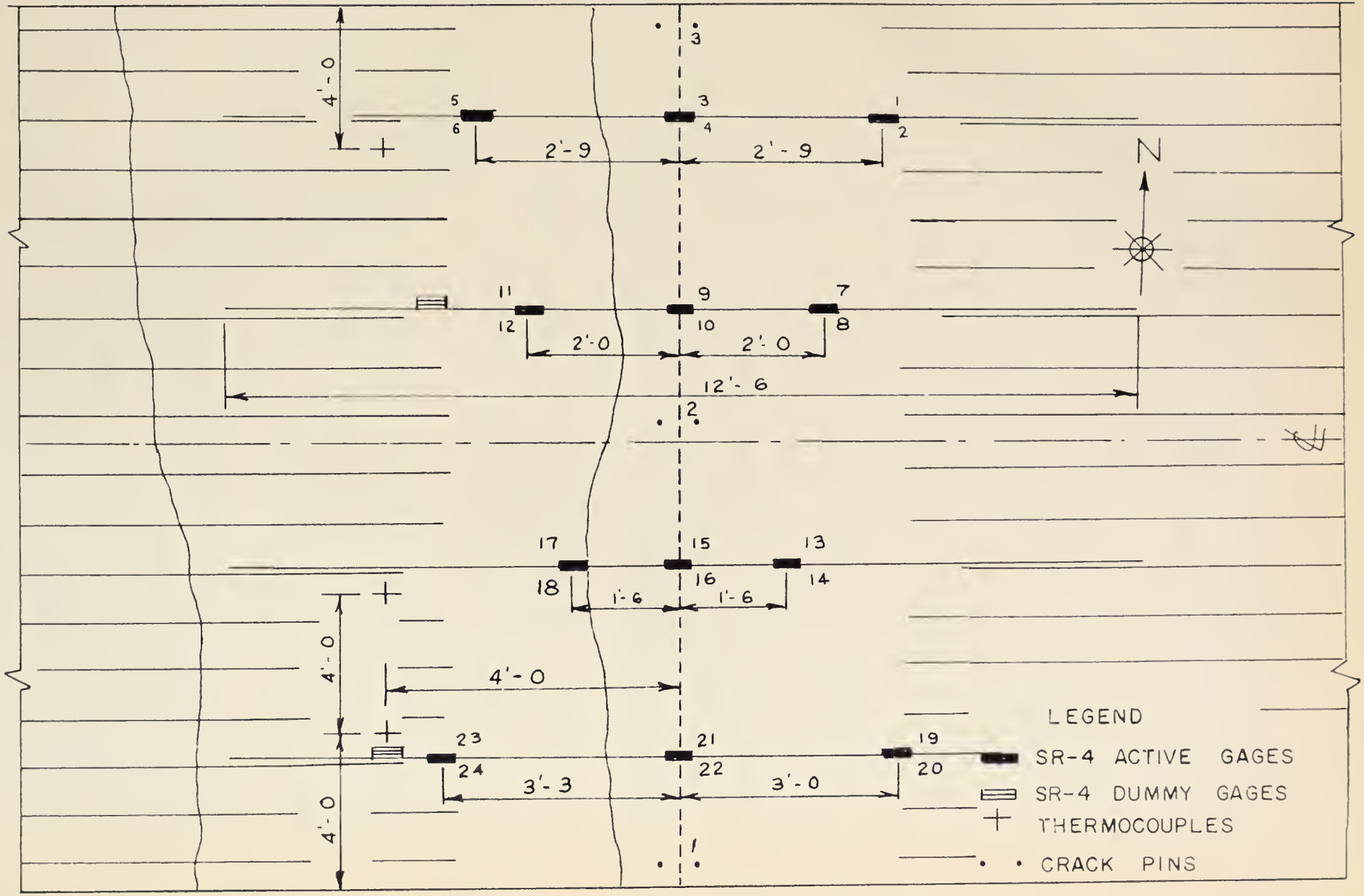


PLATE 3-8

3. Section Type B6-1

This section type is 1972 feet long, 6 inches thick and reinforced with No. 6 intermediate grade, deformed steel bars spaced at 10 inches. The reinforcing comprises 0.715% of the cross-sectional area of the pavement.

Instrumentation was installed at four selected locations. Locations IV, V, VI and VII were placed at stations 311+50, 307+00, 304+00 and 303+00 respectively. For the following reasons, only Location VI is reported in this manuscript while the other locations are eliminated.

The crack at Location IV passed through one crack width pin and bypassed another set of pins. The vertical position of the thermocouples is not known because the finishing machinery disturbed the stake to which the thermocouples were attached.

The crack at Location V passes through the crack width pins giving unreliable crack width readings.

At Location VII, only one gage remains in service at the crack. The information from one gage is not reliable.

Location VI

The concrete was poured at 8 a.m. on October 16, 1958. Presently, 6 out of 8 gages at the crack are functioning. Three gages at points away from a crack have been disconnected. Plate 6-9 shows the location of gages.

The magnitude of the readings recorded by the gages at the crack seems to indicate that the bars spanning the crack did not yield. Much confidence cannot be placed in the absolute value of the strain because of the long interval between the last reading

in the winter and the first reading in the summer. Relative magnitudes are reliable.

Plate 6-1 has a plot of three time curves. The average slab temperature curve is the average of the slab temperature as measured by three thermocouples. The average slab temperature increased until July, then it decreased. Daily variations in slab temperature were greatest in the early part of August.

The average crack width curve is the plot of the average crack width measured by two sets of crack width pins. A crack passed through the third set of pins so that readings from it were unreliable. The daily variation in crack width is small with the largest daily variation occuring in August. Both this curve and the crack width temperature curve, plotted on Plate 6-5, show that the crack closed completely at a temperature of 69°F. The concrete was in compression when slab temperatures increased above 69°F. Seasonal behavior is very pronounced.

The average strain at a crack is the average reading of the six functioning gages. In June, the average strain was approximately 200 micro inches per inch tension. In July the strain was approximately 800 micro inches per inch compression. The compressive strains decreased with decreasing average slab temperature until in January the strain was approximately 1100 micro inches per inch tension.

The time curve for the average strain of gages 17 and 18 on Plate 6-2 shows the same shift from June to July as does the strain at a crack. The range of daily variation is approximately the same for all periods when readings were obtained.

The strain transfer curves on Plate 6-3 show a very peculiar behavior for gages away from a crack in the south lane. Activated bond extended for a distance about 24 bar diameters away from a crack. The shift in average strain at a crack and the peculiar behavior of the gages in the south lane can be explained with an examination of the strain pattern at the crack shown on Plate 6-7. The south gaged bar underwent the greatest change in strain with changing slab temperature, while the north gaged bar showed very little change. It can be concluded that the pavement slab is acting as a beam causing bending in a horizontal plane. Cold temperatures create tensile strains and the south lane becomes the most highly strained in tension. Hot temperatures create compressive strains and the south lane becomes the most highly strained in compression. The inside lane of horizontal curves plus some distance along the tangents should therefore have extra reinforcing. The effect of horizontal bending is far greater than the effect of plastic flow at this location, therefore the latter effect cannot be seen.

The strain temperature curve on Plate 6-4 is composed of two straight lines. The change in slope occurs at a temperature of $62^{\circ}F$. The June readings all fall to one side of the plotted line. This is a result of horizontal bending.

Plate 6-6 has the plot of steel strain versus average crack width. A single straight line is the best fit curve.

Seasonal variation can easily be seen when the points for a particular period of readings are considered separately on Plates 6-4, 6-5 and 6-6. The most pronounced seasonal variation is in horizontal bending.

Plate 6-8 shows the crack spacing within 100 feet on each side of the preformed crack. The effect of the sawed crack on the cracking pattern is doubtful. The crack widths recorded were not too wide and average strains at the crack appeared to be below the yield point.

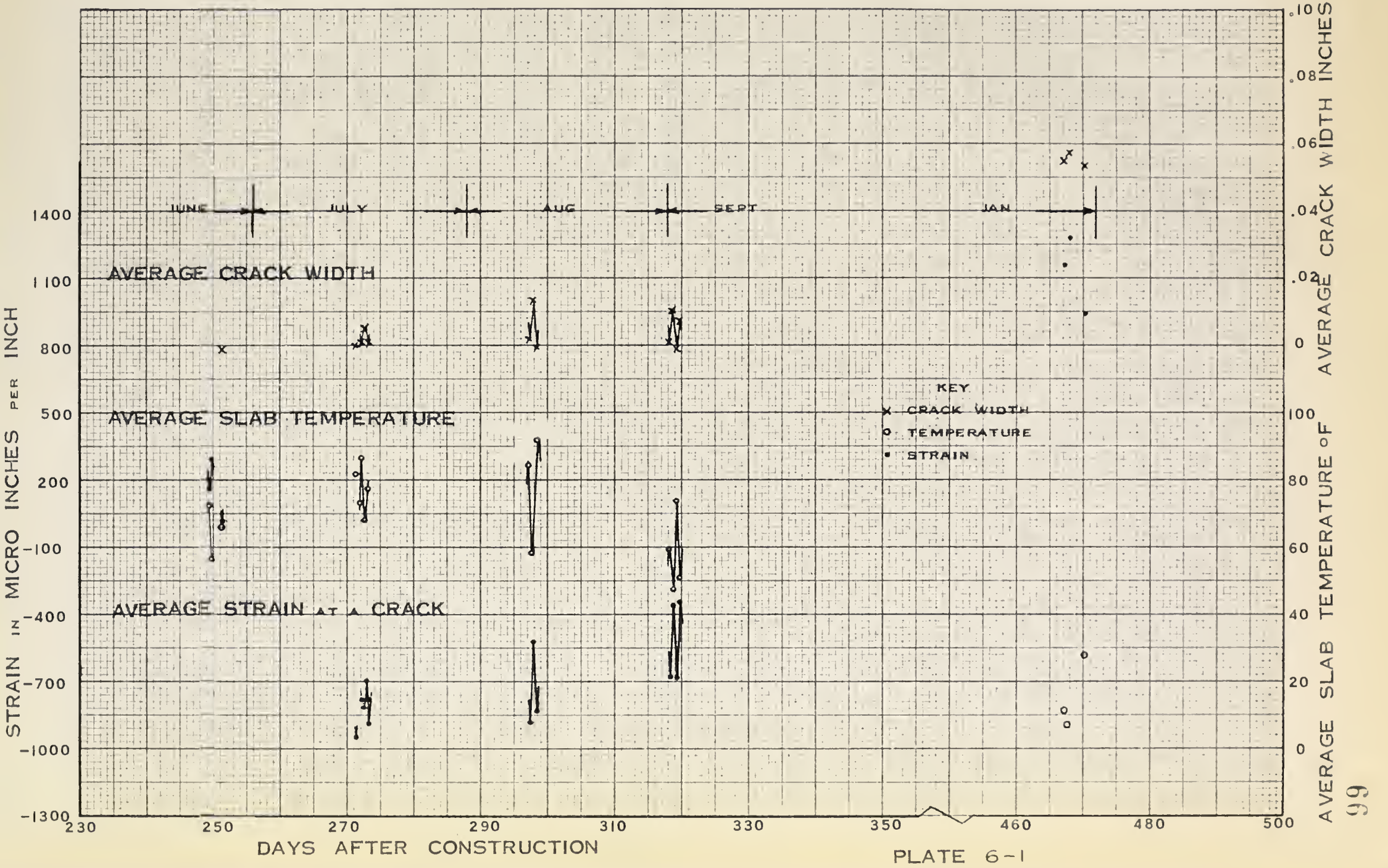

TIME CURVES
SECTION TYPE B6 – I LOCATION VI STATION 304+00
JUNE
JULY
AUG
SEPT
JAN
AVERAGE CRACK WIDTH
AVERAGE SLAB TEMPERATURE
AVERAGE STRAIN AT A CRACK
KEY
CRACK WIDTH
TEMPERATURE
STRAIN
STRAIN IN MICRO INCHES PER INCH
1400
1100
800
500
200
-100
-400
-700
-1000
-1300
AVERAGE CRACK WIDTH INCHES
.10
.08
.06
.04
.02
0
AVERAGE SLAB TEMPERATURE °F
100
80
60
40
20
0
230
250
270
290
310
330
350
460
480
500
DAYS AFTER CONSTRUCTION

PLATE 6-I

TIME CURVES

SECTION TYPE B6 – I LOCATION VI STATION 304+00

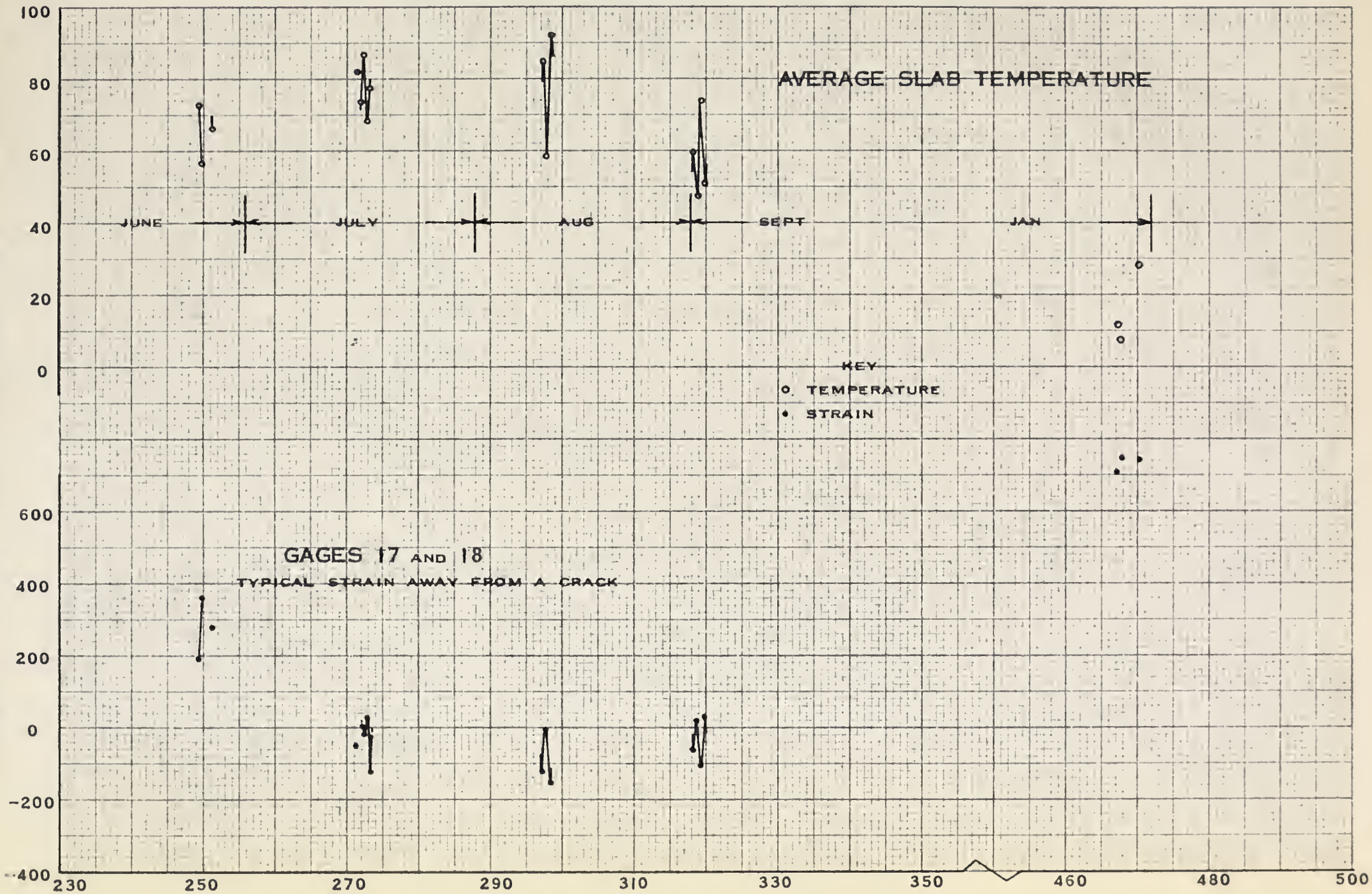


PLATE 6-2

STRAIN TRANSFER CURVES

SECTION TYPE B6 – I LOCATION VI STATION 304+00



PLATE 6 – 3

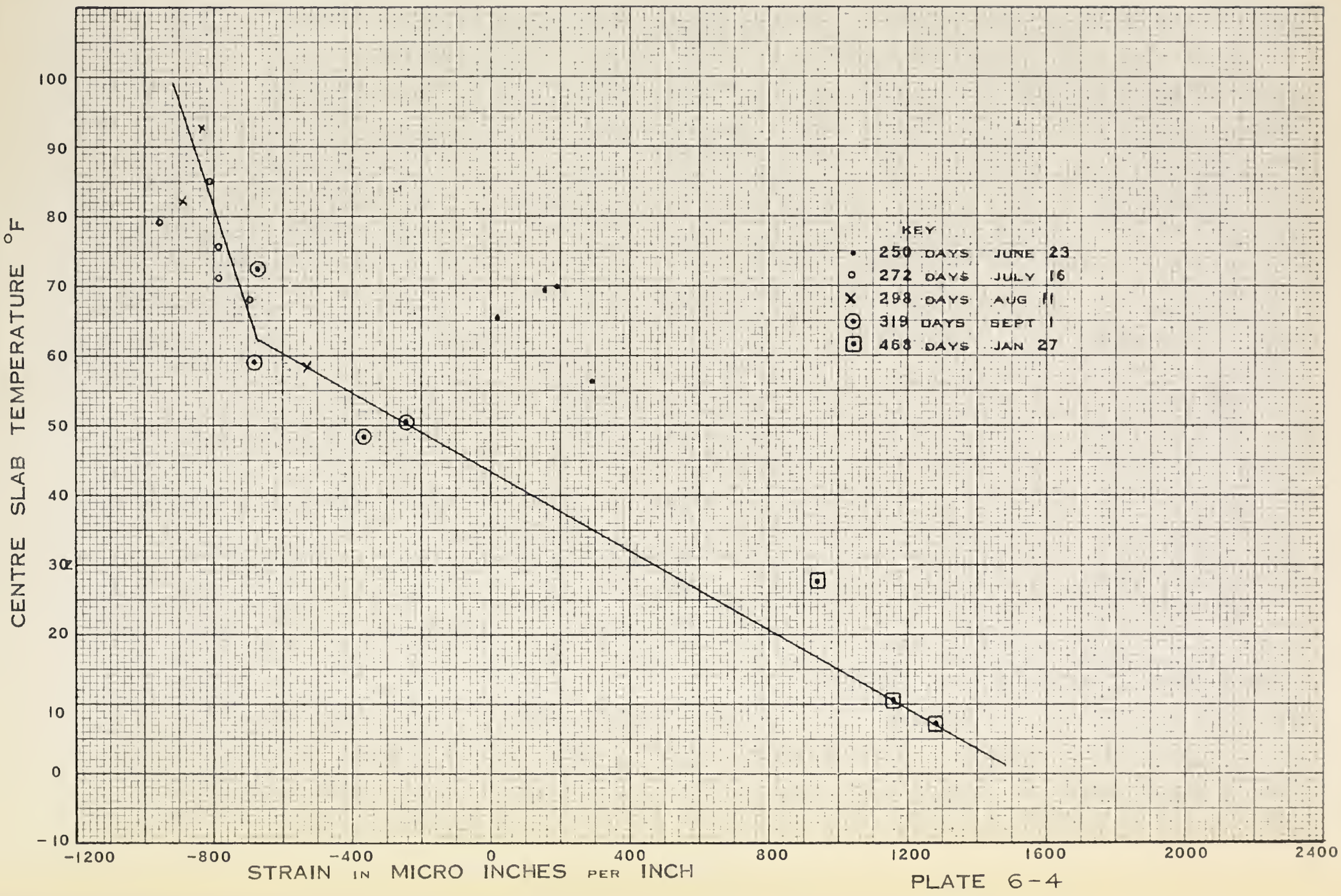

STRAIN -- TEMPERATURE CURVE
SECTION TYPE B6 – I LOCATION VI STATION 304+00
CENTRE SLAB TEMPERATURE °F
100
90
80
70
60
50
40
30
20
10
0
– 10
KEY
250 DAYS JUNE 23
272 DAYS JULY 16
298 DAYS AUG 11
319 DAYS SEPT 1
468 DAYS JAN 27
–1200
–800
–400
0
400
800
1200
1600
2000
2400
STRAIN IN MICRO INCHES PER INCH

PLATE 6-4

CRACK WIDTH – TEMPERATURE CURVE

SECTION TYPE B6 – I LOCATION VI STATION 304+00

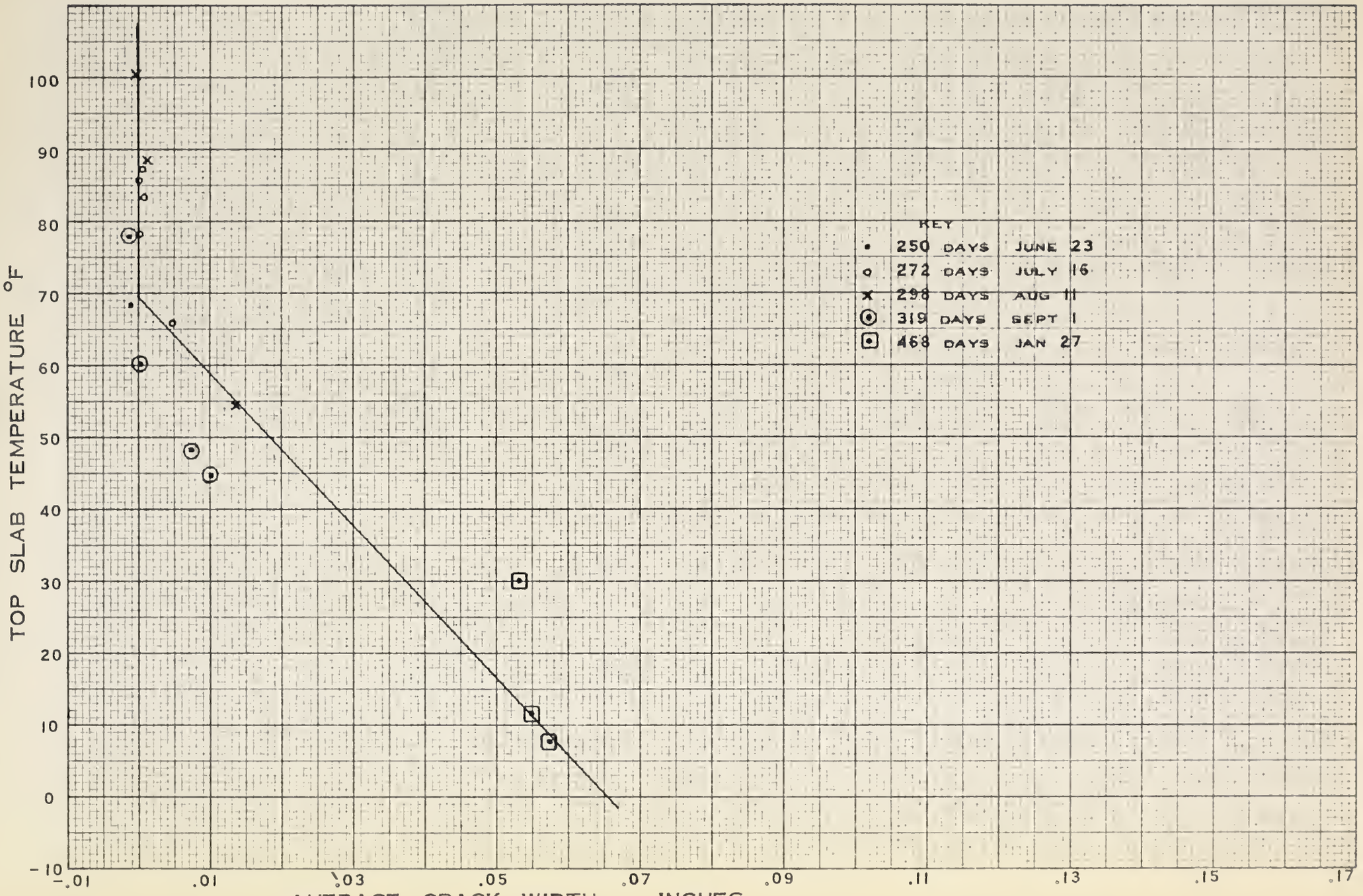


PLATE 6-5

STEEL STRAIN -- CRACK WIDTH CURVE

SECTION TYPE B6 – I LOCATION VI STATION 304+00

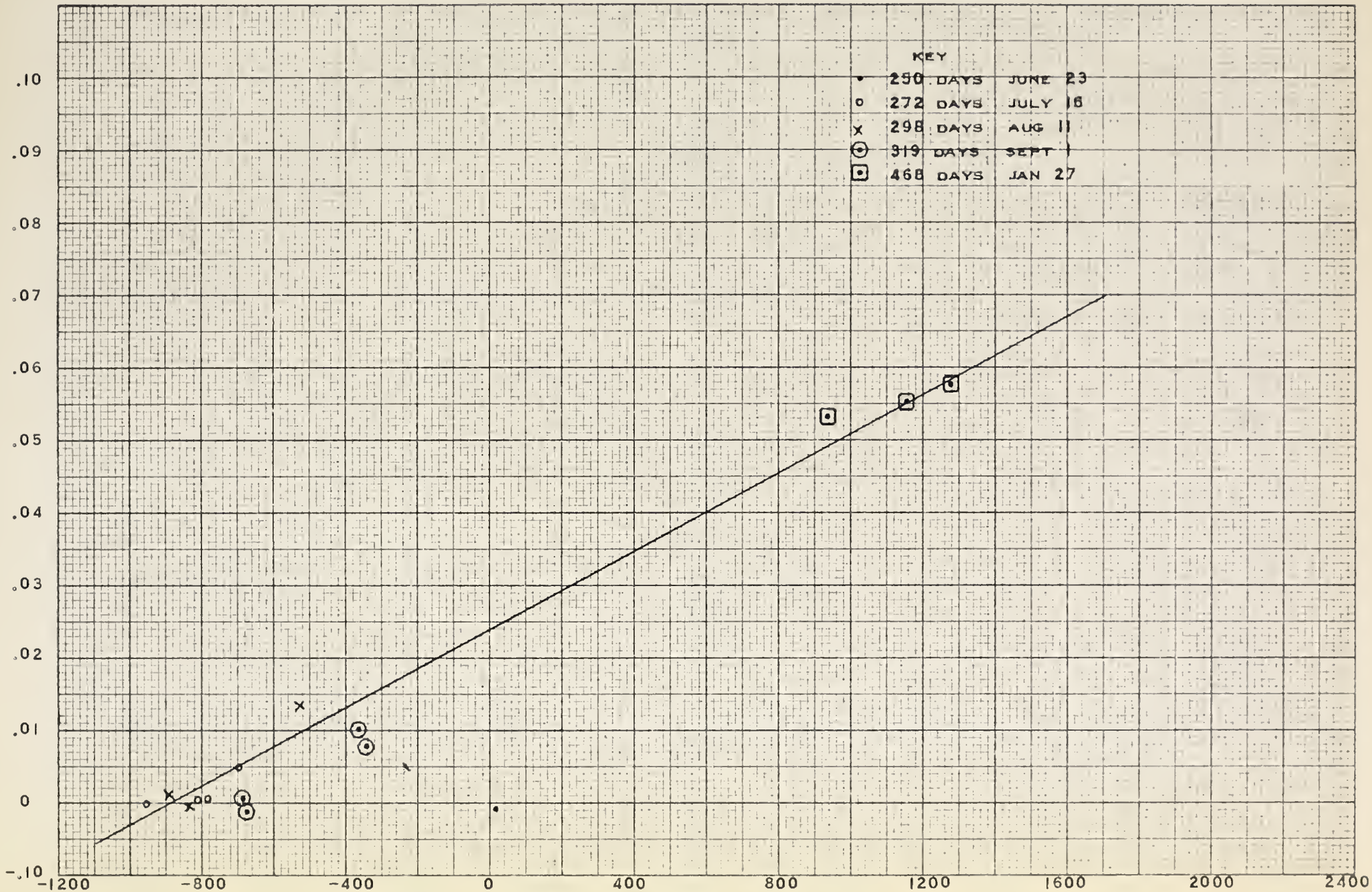


PLATE 6-6

STRAIN PATTERN AT CRACK

SECTION TYPE B6 – I LOCATION VI STATION 304+00

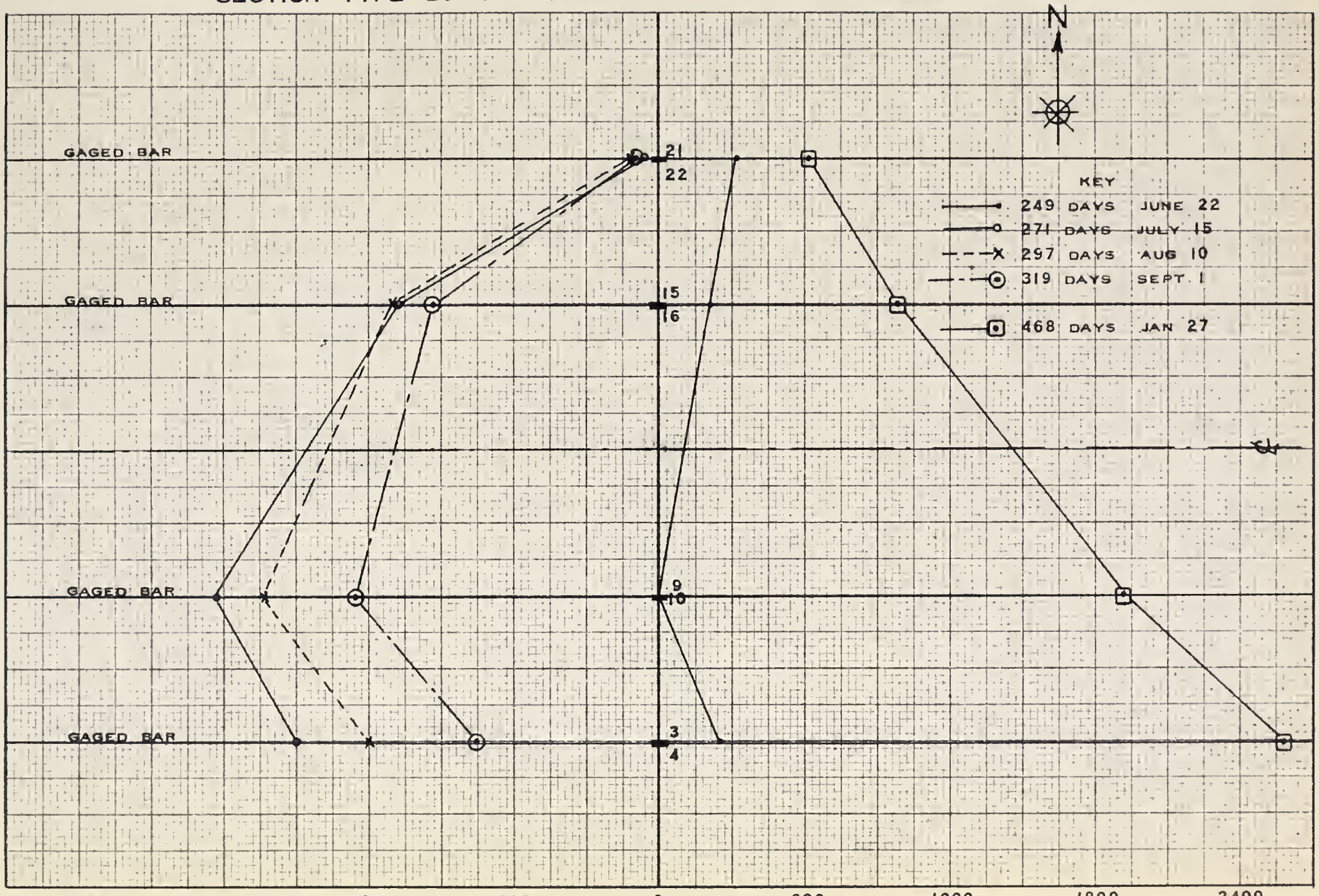
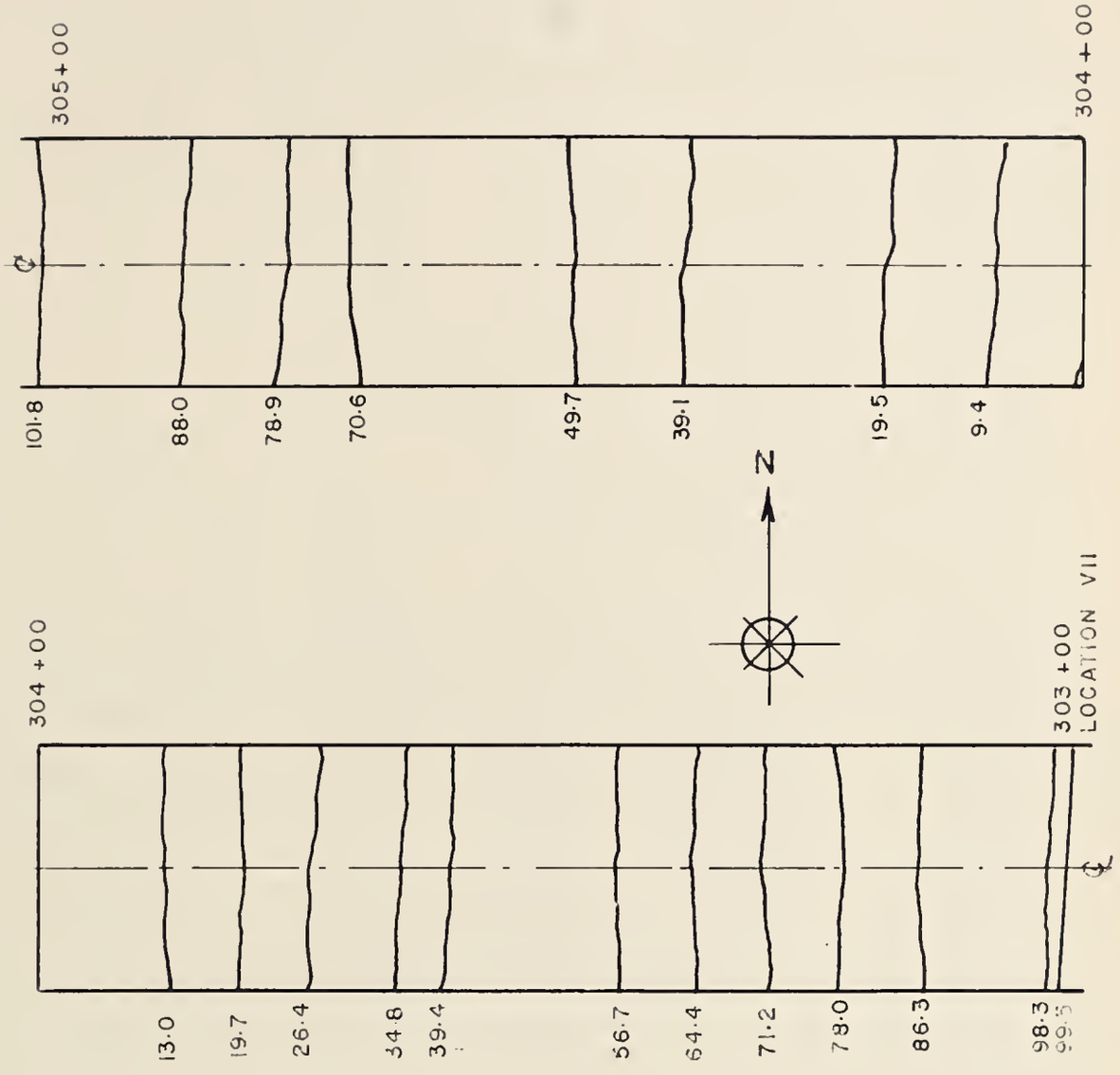


PLATE 6-7



SCALE 1" = 20'
LOCATION VI
STATION 304+00
TYPE B6-1

CRACK SPACING

PLATE 6-8

GAGE POSITIONS

SECTION TYPE B6-1 LOCATION VI STATION 304+00

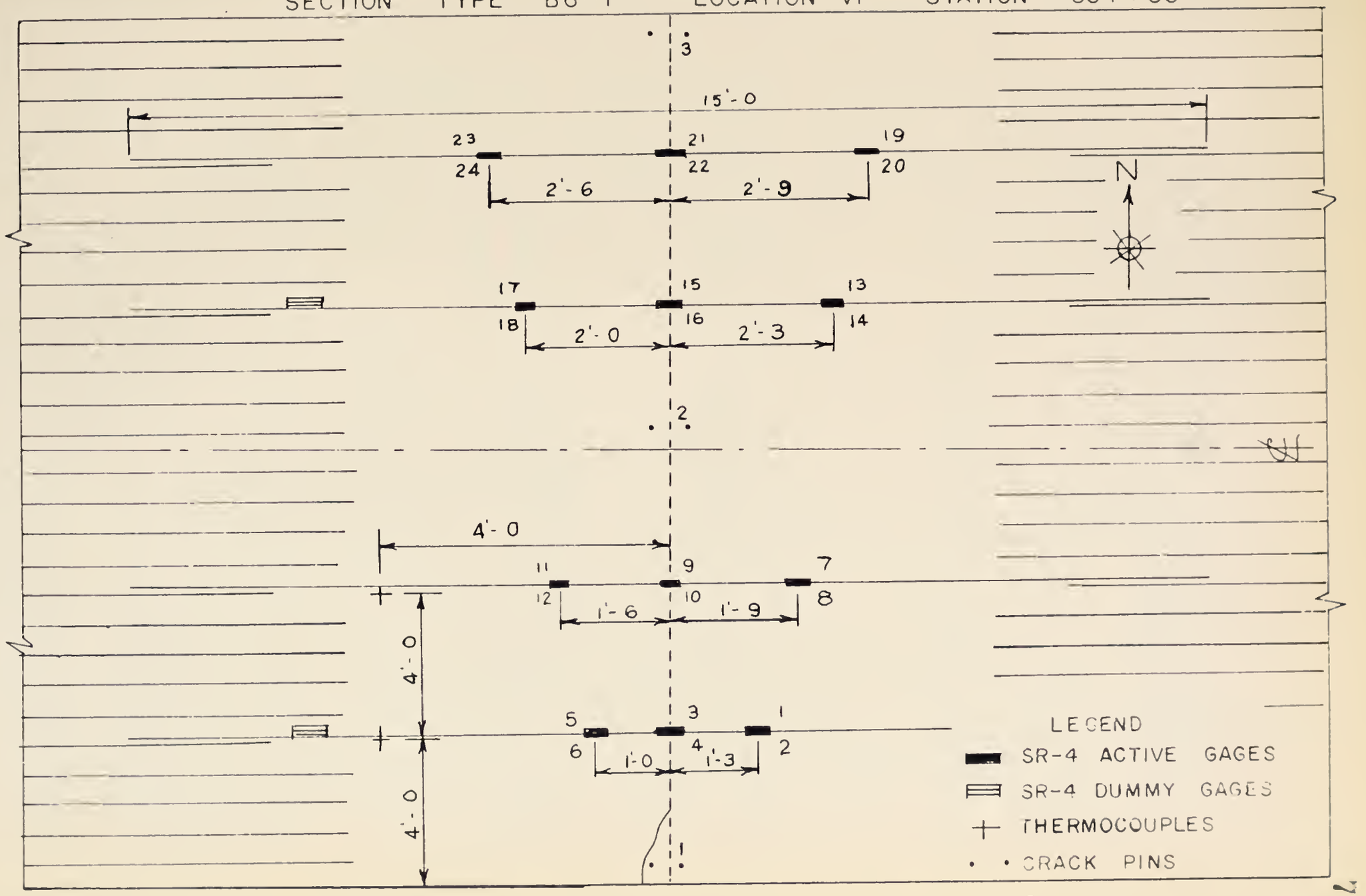


PLATE 6-9

4. Section Type B6-2

Section type B6-2 is 2205 feet long, 6 inches thick and reinforced with No. 6, intermediate grade, deformed steel bars at 9 inches on centers. The reinforcing comprises 0.815% of the cross-sectional area of the pavement.

Locations VIII and IX were instrumented at Stations 294+00 and 289+00 respectively. All of the gages at the crack at Location VIII failed. Therefore this location is not considered in this thesis.

Location IX

The concrete was poured at the test panel at 11 a.m. on October 20, 1958. Plate 9-8 shows the location of gages in the test panel. Seven out of eight gages at the crack are still functioning. Five gages at points away from the crack were disconnected.

The strains as indicated by gages in the north lane appear to be very erratic for no explainable reason. Therefore whenever strains are considered, only the gages in the south lane are analyzed. Yielding did not occur at this location. One bar (gages 15 and 16) appears to have yielded by January, 1960.

Plate 9-1 shows a plot of three time curves. The average slab temperature is the average of measurements obtained by three thermocouples. An increase is noted in the average slab temperature until July; then a decrease in the average slab temperature occurs. The range of daily variation is least in June and approximately constant for the remaining periods.

The average crack width curve is the average of measurements

from two sets of crack width pins. A crack passed through the third set of pins.

Reference should also be made to the crack width temperature curve on Plate 9-5. From these two plots, it can be seen that the crack closed completely at a temperature of 69°F. Average slab temperatures above 69°F resulted in compression of the concrete. The fact that the average slab temperature was generally above 69°F in July, offers an explanation as to why the daily variation in the magnitude of the crack width is least during this period.

The crack width-temperature curve consists of two straight lines for the readings taken during the summer. Readings during January 1960 are offset in a parallel line. This seems to demonstrate the relief afforded to the sawed crack by the opening of adjacent cracks.

The average strain at a crack is the average of readings obtained from the three "SR-4" gages in the south lane. The range of daily variation was least in June and July. The temperature variation was least in June, therefore the strain variation was also small. The daily strain variation was small in July because the crack was closed most of the time and the concrete assisted the steel in taking the strain.

The strain at gage 12 is typical of the strain at points away from the crack and is plotted on Plate 9-2. The range of daily variation is least for June and constant for the remaining periods. This corresponds to the daily temperature variation. The close correlation between strain variation at points away from a crack and slab temperature variations, provides conclusive evidence that

the strain in the steel at points away from the crack is a measure of the strain due to temperature variations in the bonded steel and concrete away from a crack. Effects of plastic flow are evident.

The strain transfer curves on Plate 9-3 show the erratic behavior of the "SR-4" gages in the north lane. Activated bond extended to a distance about 24 bar diameters away from the crack. Cracks passing through several gages developed near the sawed crack (Plate 9-8) soon after construction. These cracks were closed during the summer and opened with the colder temperatures of the winter. This can be seen from the increased strain in the gages at these cracks.

The strain-temperature curve on Plate 9-4 demonstrates the straight line relationship between the steel strains and the centre slab temperature. Seasonal variation is very noticeable.

The steel strain crack width curve on Plate 9-6 shows two parallel lines. One line includes all the points measured during the summer when the adjacent cracks were closed. The second line includes the points measured in January 1960 when the adjacent cracks were open. This demonstrates the effect of the opening of adjacent cracks.

Plate 9-7 shows the crack spacing within 100 feet on each side of the preformed crack. There seems to be very little effect on the crack spacing.

TIME CURVES

SECTION TYPE B6 – 2 LOCATION IX STATION 289+00

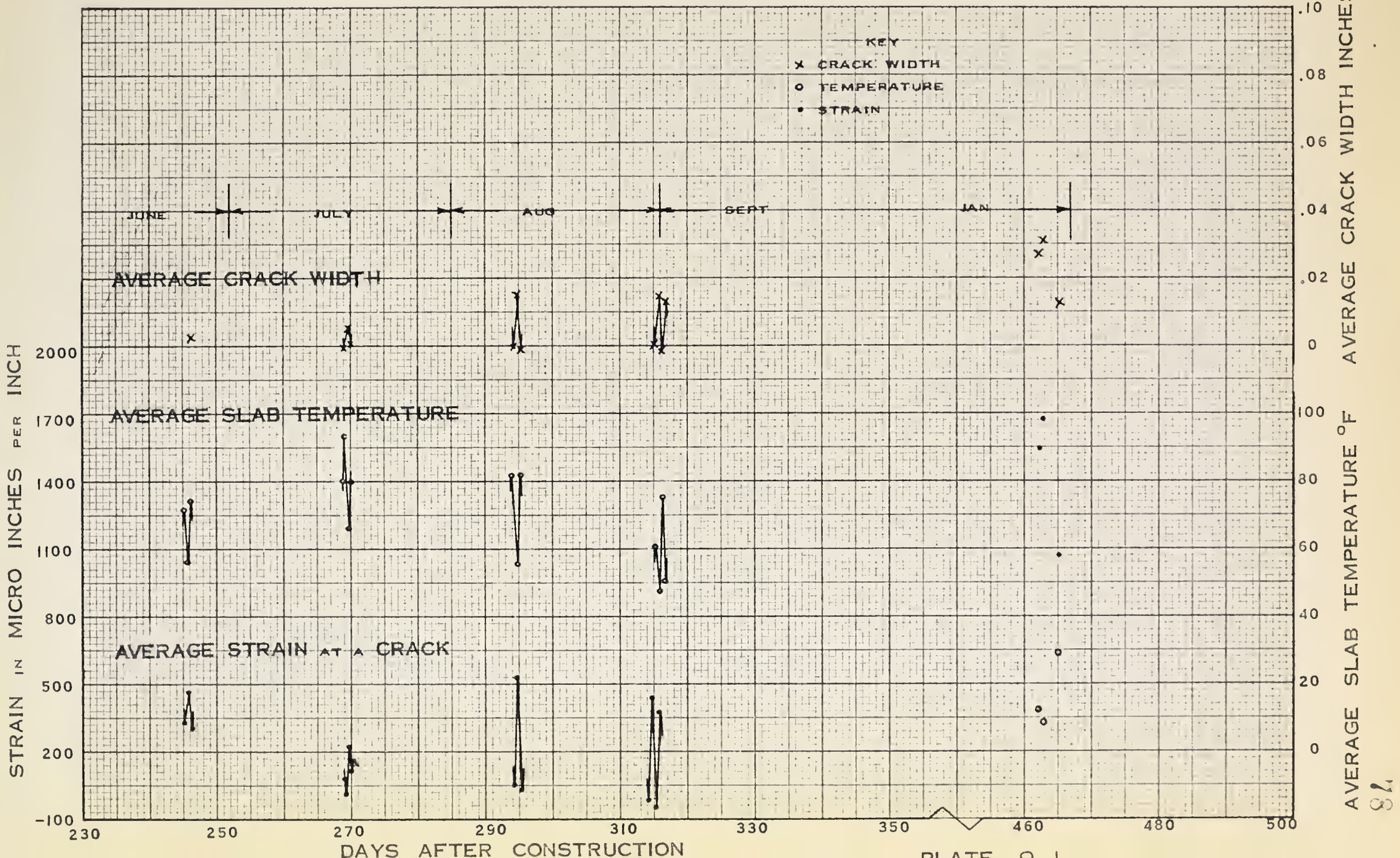


PLATE 8.1

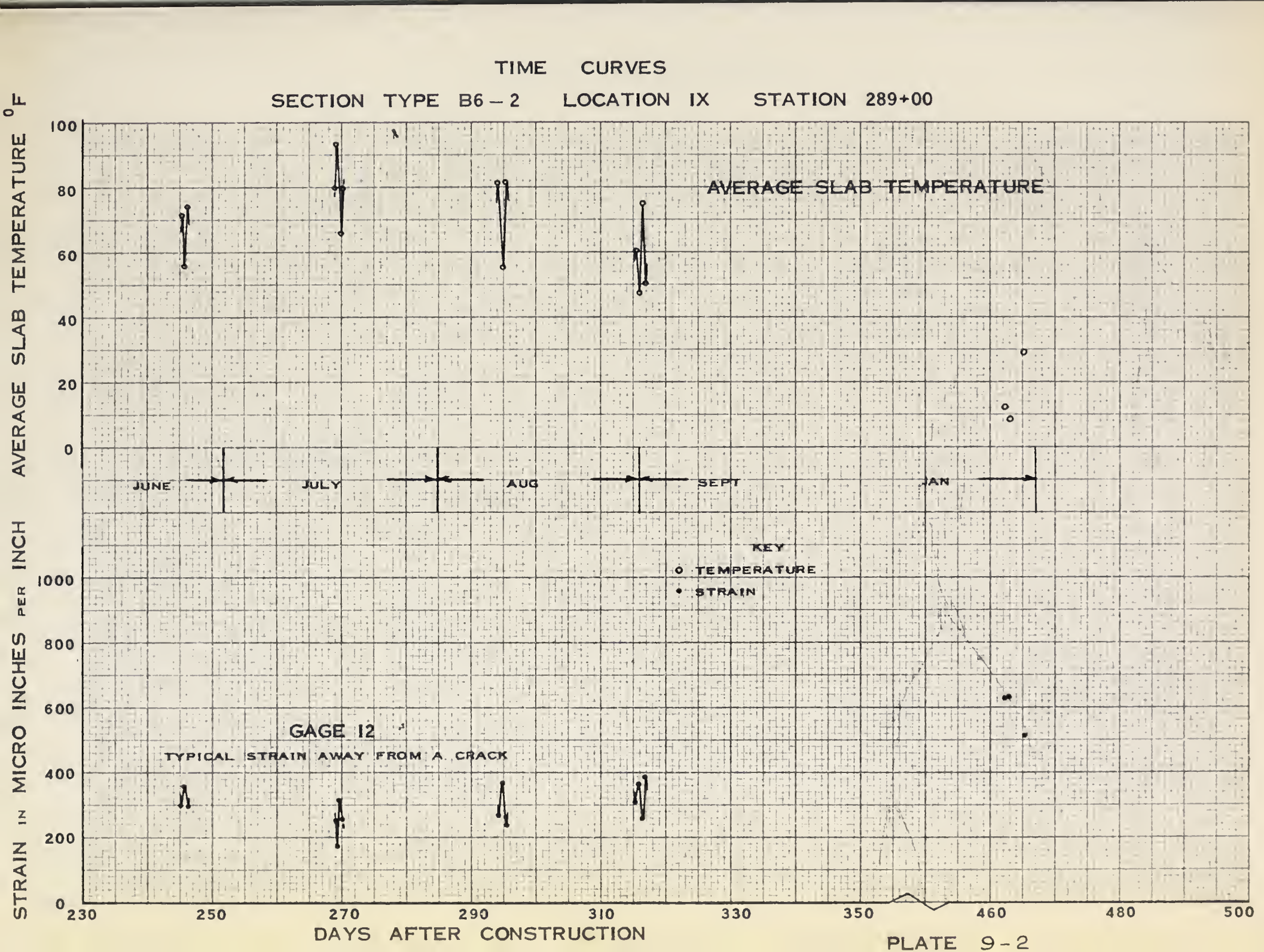

TIME CURVES
SECTION TYPE B6 – 2 LOCATION IX STATION 289+00
AVERAGE SLAB TEMPERATURE
STRAIN IN MICRO INCHES PER INCH AVERAGE SLAB TEMPERATURE °F
100
80
60
40
20
0
1000
800
600
400
200
0
JUNE
JULY
AUG
SEPT
JAN
KEY
TEMPERATURE
STRAIN
GAGE 12
TYPICAL STRAIN AWAY FROM A CRACK
230
250
270
290
310
330
350
460
480
500
DAYS AFTER CONSTRUCTION

PLATE 9-2

STRAIN TRANSFER CURVES

SECTION TYPE B6 – 2 LOCATION IX STATION 289+00

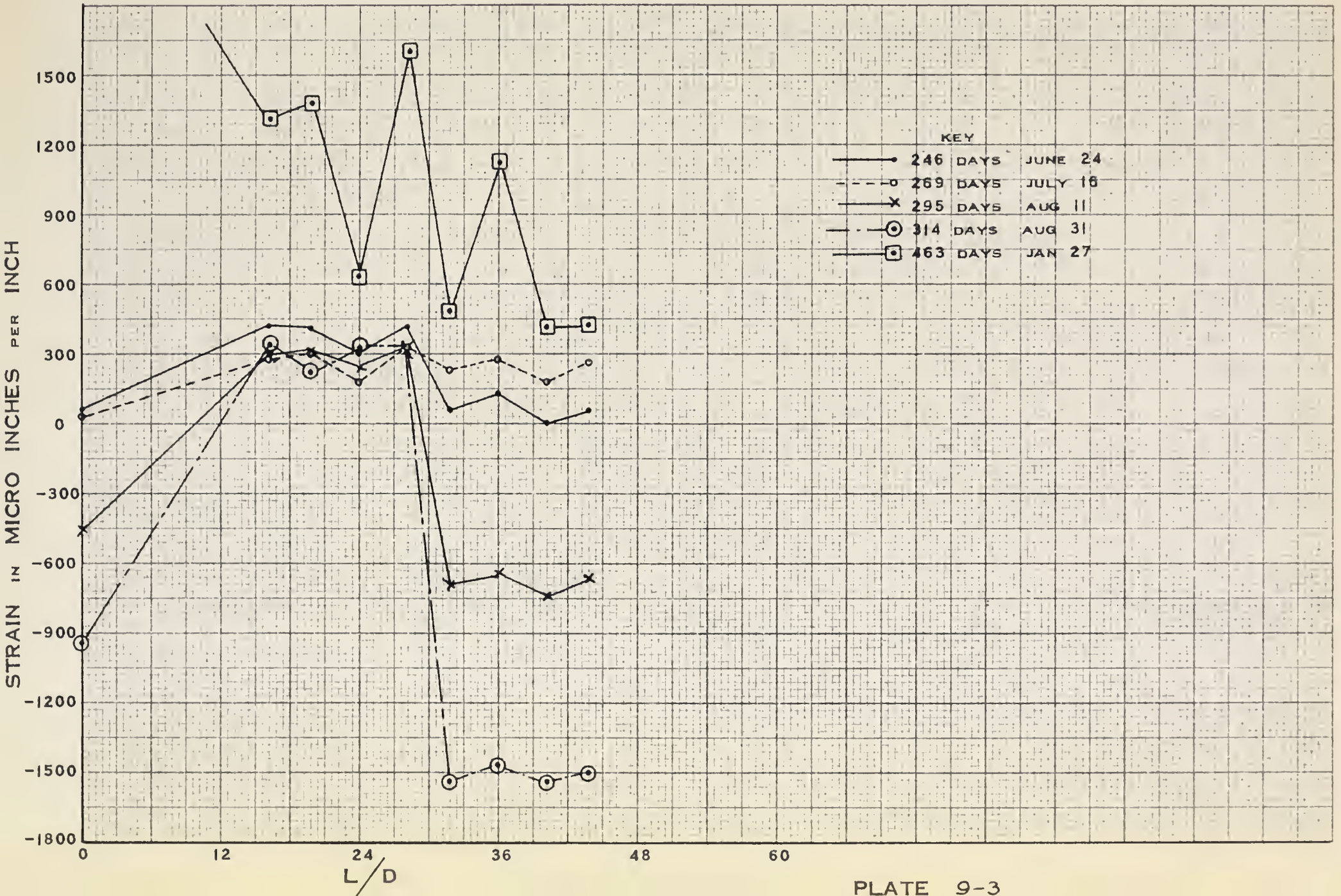


PLATE 9-3

STRAIN – TEMPERATURE CURVE

SECTION TYPE B6 – 2 LOCATION IX STATION 289+00

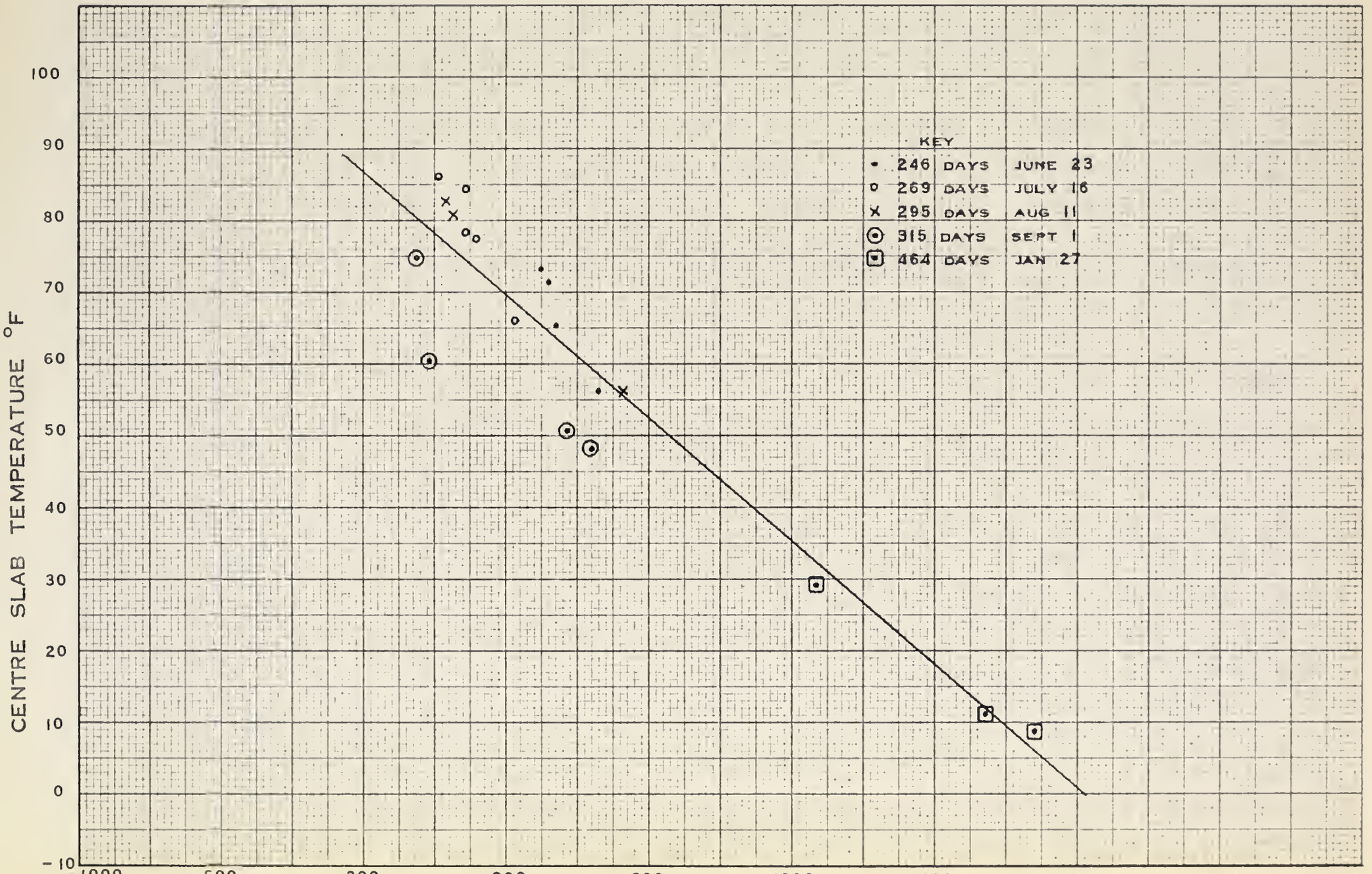


PLATE 9-4

CRACK WIDTH – TEMPERATURE CURVE

SECTION TYPE B6 – 2 LOCATION IX STATION 289+00

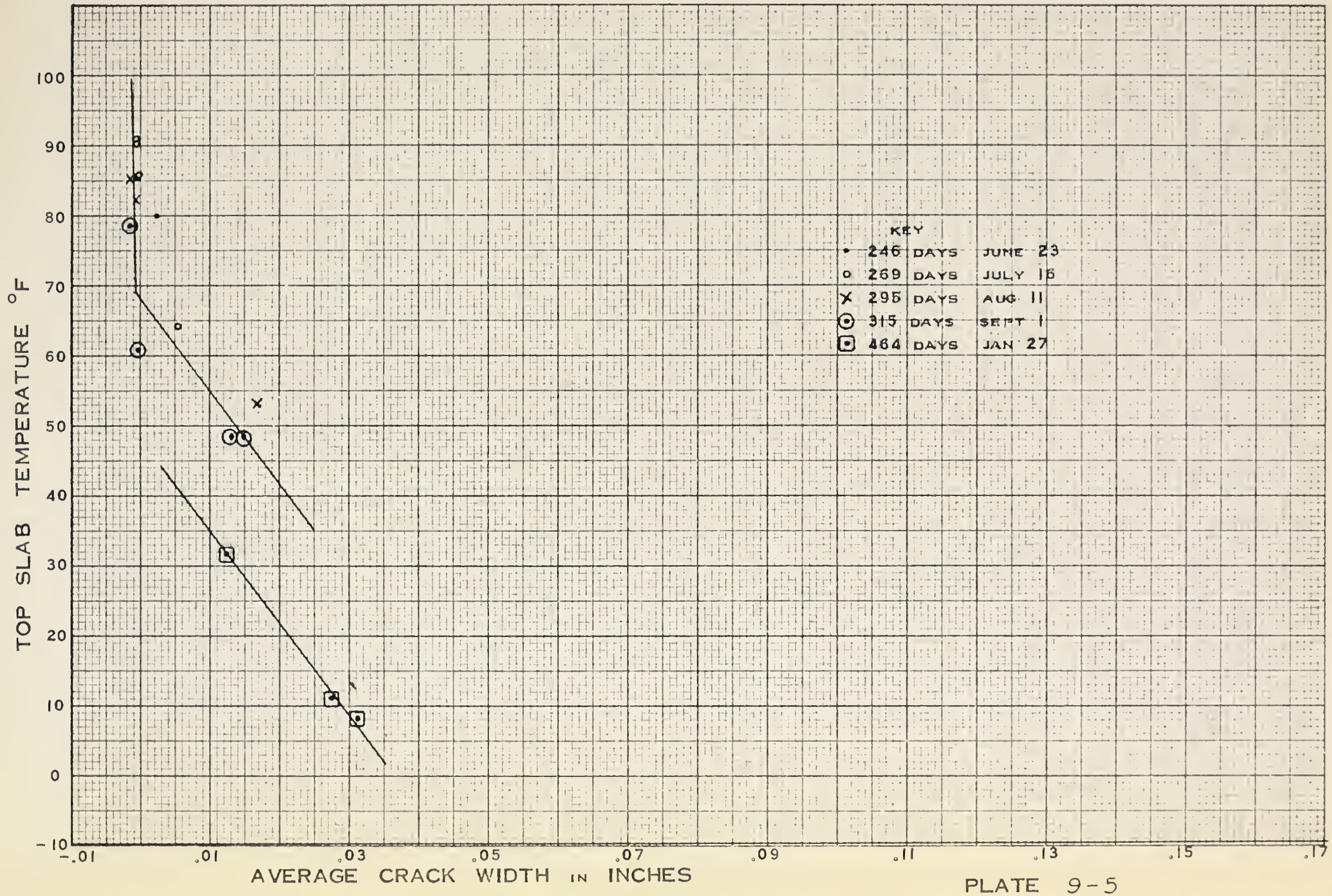


PLATE 9-5

STEEL STRAIN – CRACK WIDTH CURVE

SECTION TYPE B6 – 2 LOCATION IX STATION 289+00

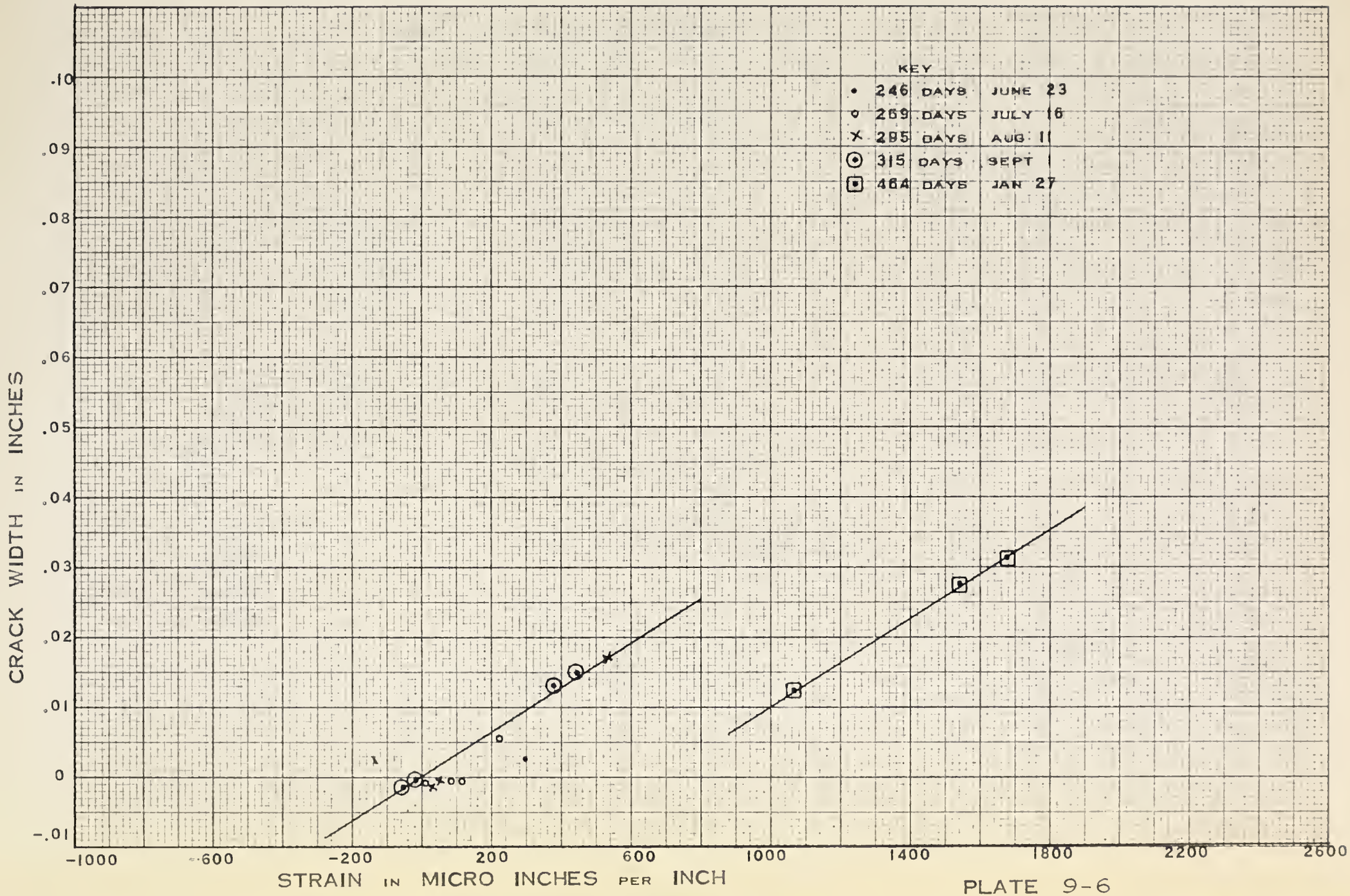
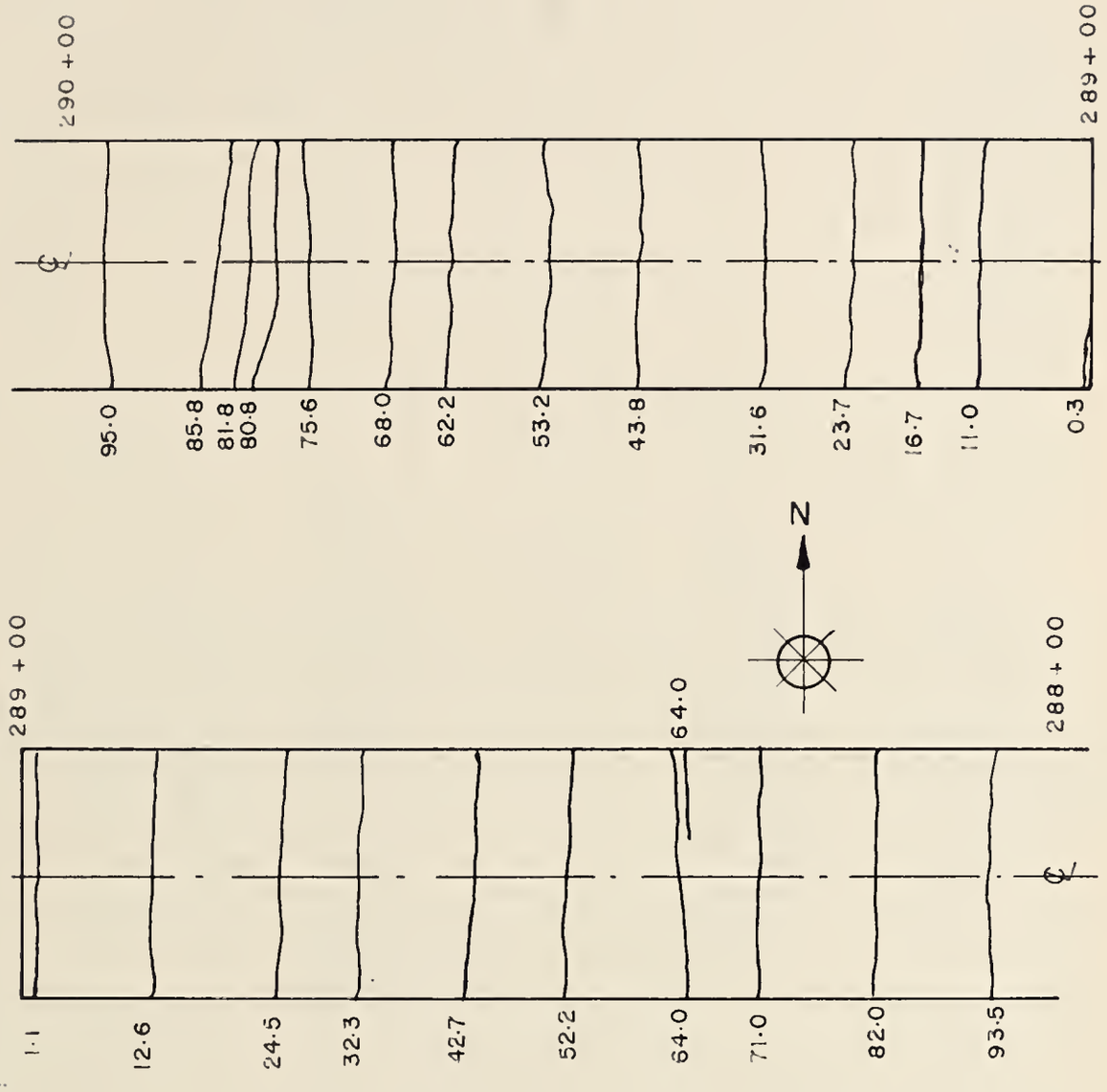


PLATE 9-6



SCALE 1" = 20'
LOCATION IX
STATION 289 + 00
TYPE B6 - 2

CRACK SPACING

PLATE 9-7

GAGE POSITIONS

SECTION TYPE B6-2 LOCATION IX STATION 289+00

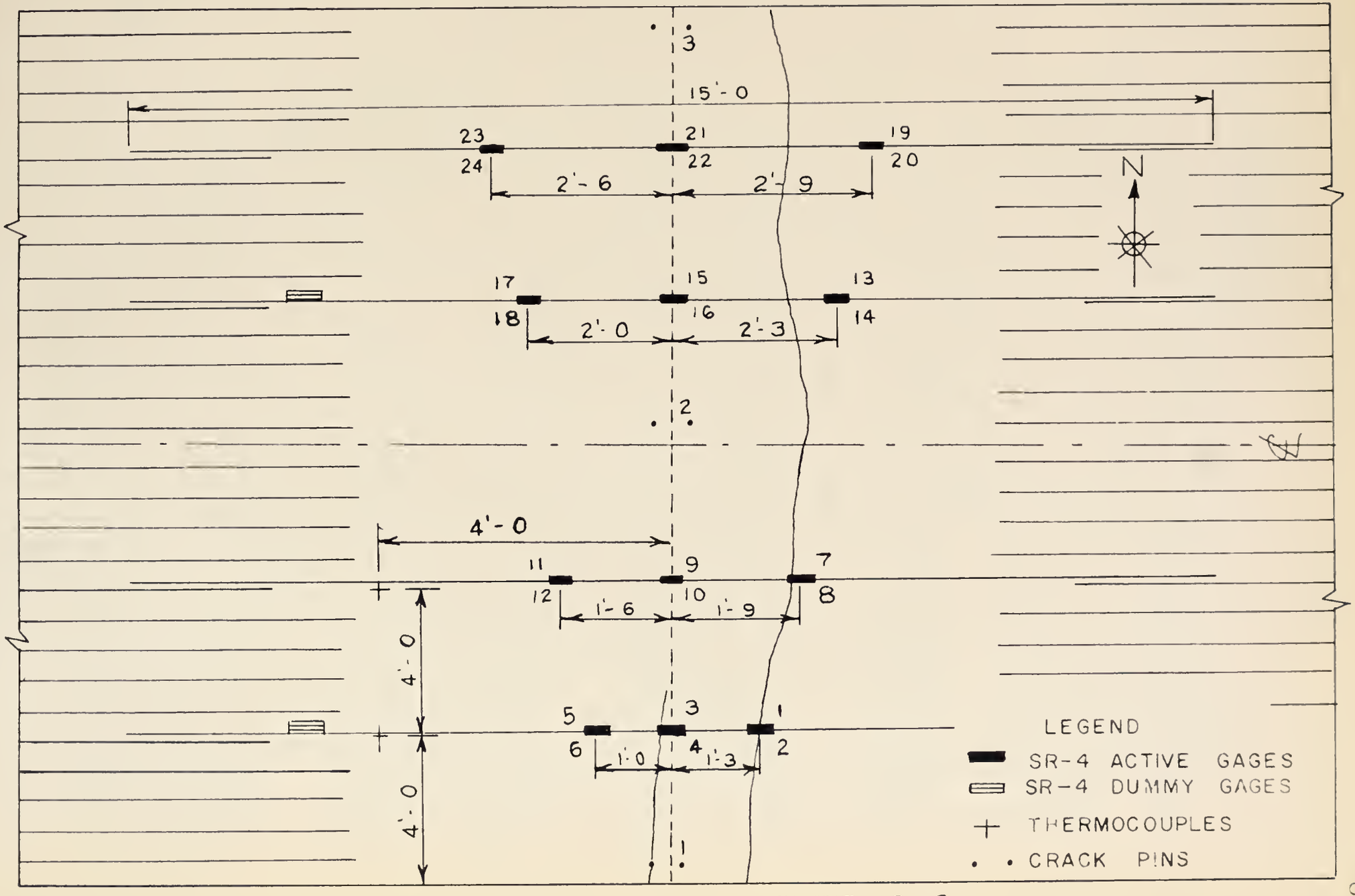


PLATE 9-8

B. Conventionally Reinforced Concrete Pavement

1. Section Type A-6

This section type is 2610 feet long, 6 inches thick and longitudinally reinforced with No. 4 intermediate grade deformed steel bars. The reinforcing comprises 0.185% of the cross-sectional area of the pavement. Load transfer joints are spaced at 30 feet. Location X was placed at Station 262+50. The concrete was poured on October 28, 1958.

To date, only one gage at the preformed crack has failed. Four gages at points away from the crack have been disconnected. Plate 10-7 shows the location of gages.

Readings obtained from the gages at the crack indicate that the steel did not strain beyond the yield point. Compressive strains were encountered at the crack during the summer. It is doubtful whether the absolute magnitude of the strains is reliable but the daily range in strain is reliable.

Before further discussion of results is continued, one aspect of conventional reinforced concrete pavement behavior should be reviewed. Changes in length, due to temperature changes, are compensated by the movement of the slab over the subgrade from the joints towards the middle of the slab. Tension stresses built up within the slab are the result of subgrade restraint.

Three time curves are plotted on Plate 10-1. The average slab temperature curve is the average of measurements provided by three thermocouples. Average slab temperature increased until July, then began to decrease. The largest temperature range between morning and afternoon was recorded in August.

The average crack width curve is the average reading of three sets of crack width pins. The crack never did close completely but reached a limiting value. The widest crack was recorded in August. This corresponds to the greatest single daily temperature variation.

The average steel strain at a crack curve represents the average reading of the seven gages at the crack. The plot seems to indicate a rather strange steel strain behavior at the crack. The largest daily variation in strain was in August, again corresponding to the greatest single daily temperature variation. Since the strains in the steel are caused by subgrade resistance to movement, the maximum steel strain will occur when the slab movement is greatest.(4) Greatest movement will occur on the day when the greatest single daily temperature variation occurs.

The absolute magnitude of the average strain at a crack shows increasing compression throughout the summer. The strain at gages 17 and 18 on Plate 10-2 illustrates the same type of behavior. The strain transfer curves on Plate 10-3 indicate very erratic behavior. The reason for this erratic behavior in the steel strains is not known. This behavior may be due to zero drift in the gages or it may be the actual behavior of the pavement.

The average strain in the steel as measured by gages 17 and 18 is plotted on Plate 10-2. The range of daily variation in strain is very small. If it is assumed that the strain in the steel away from a crack is the measure of the strain in the bonded concrete and steel, then it can be shown that when a change in

length occurs, due to temperature change, the slab slides over the subgrade. Very little strain occurs in the bonded concrete and steel. Jointed concrete pavements are known to move over the subgrade when a change in length occurs.[3] The strains in the steel at points away from accrack are therefore the measure of the strain in the bonded concrete and steel.

The strain transfer curves on Plate 10-3 show erratic strain gage behavior. Activated bond extended to a distance about 30 bar diameters away from the crack.

Plate 10-4 has a plot of the average strain at a crack versus the centre slab temperature. Each period of reading can be represented by a straight line plotted through the points for any particular period. This results in a series of roughly parallel lines.

The crack width temperature curve on Plate 10-5 and the crack width steel strain curve on Plate 10-6 demonstrate the same type of seasonal behavior. No single line can be employed to completely describe any of these three curves.

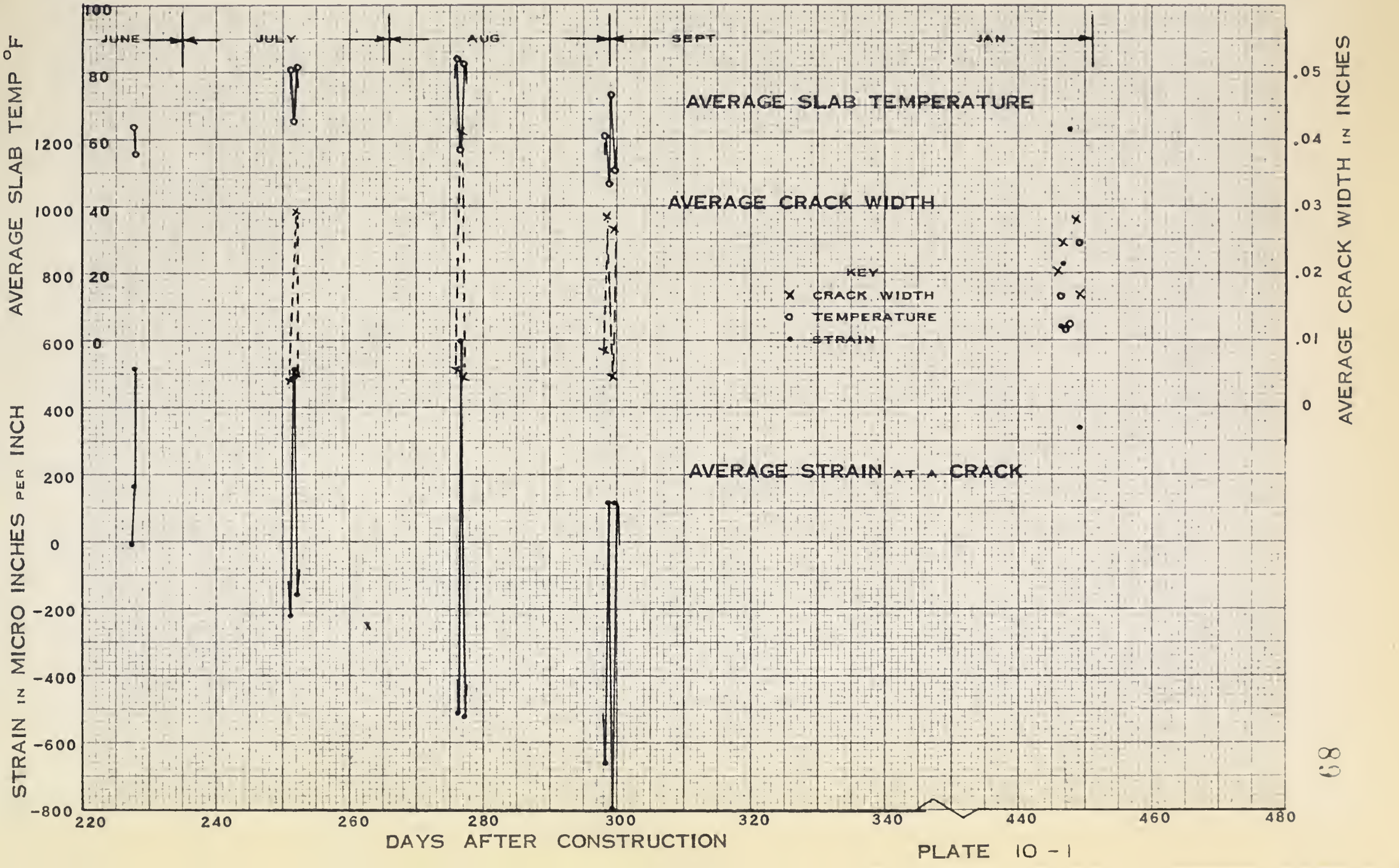

TIME CURVES
SECTION TYPE A – 6 LOCATION X STATION 262+50
JUNE
JULY
AUG
SEPT
JAN
AVERAGE SLAB TEMPERATURE
AVERAGE CRACK WIDTH
KEY
X CRACK WIDTH
o TEMPERATURE
• STRAIN
AVERAGE STRAIN AT A CRACK
AVERAGE SLAB TEMP °F
STRAIN IN MICRO INCHES PER INCH
AVERAGE CRACK WIDTH IN INCHES
100
80
60
40
20
0
1200
1000
800
600
400
200
0
-200
-400
-600
-800
.05
.04
.03
.02
.01
0
220
240
260
280
300
320
340
440
460
480
DAYS AFTER CONSTRUCTION

PLATE 10 - 1

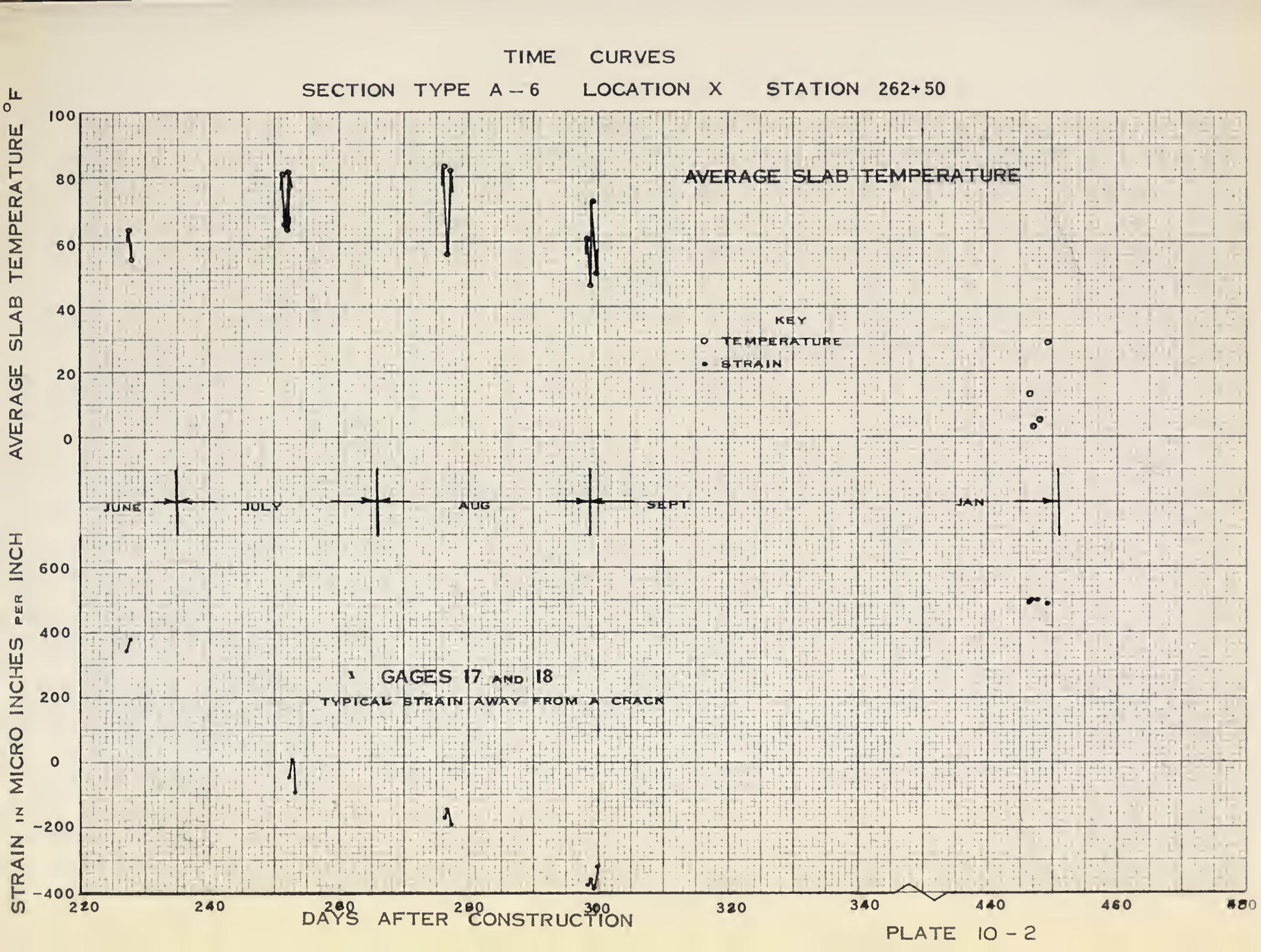

TIME CURVES
SECTION TYPE A – 6 LOCATION X STATION 262+50
AVERAGE SLAB TEMPERATURE °F
STRAIN IN MICRO INCHES PER INCH
AVERAGE SLAB TEMPERATURE
KEY
o TEMPERATURE
• STRAIN
100
80
60
40
20
0
600
400
200
0
-200
-400
JUNE
JULY
AUG
SEPT
JAN
GAGES 17 AND 18
TYPICAL STRAIN AWAY FROM A CRACK
220
240
260
280
300
320
340
440
460
480
DAYS AFTER CONSTRUCTION

PLATE 10 – 2

STRAIN TRANSFER CURVES

SECTION TYPE A – 6 LOCATION X STATION 262+50

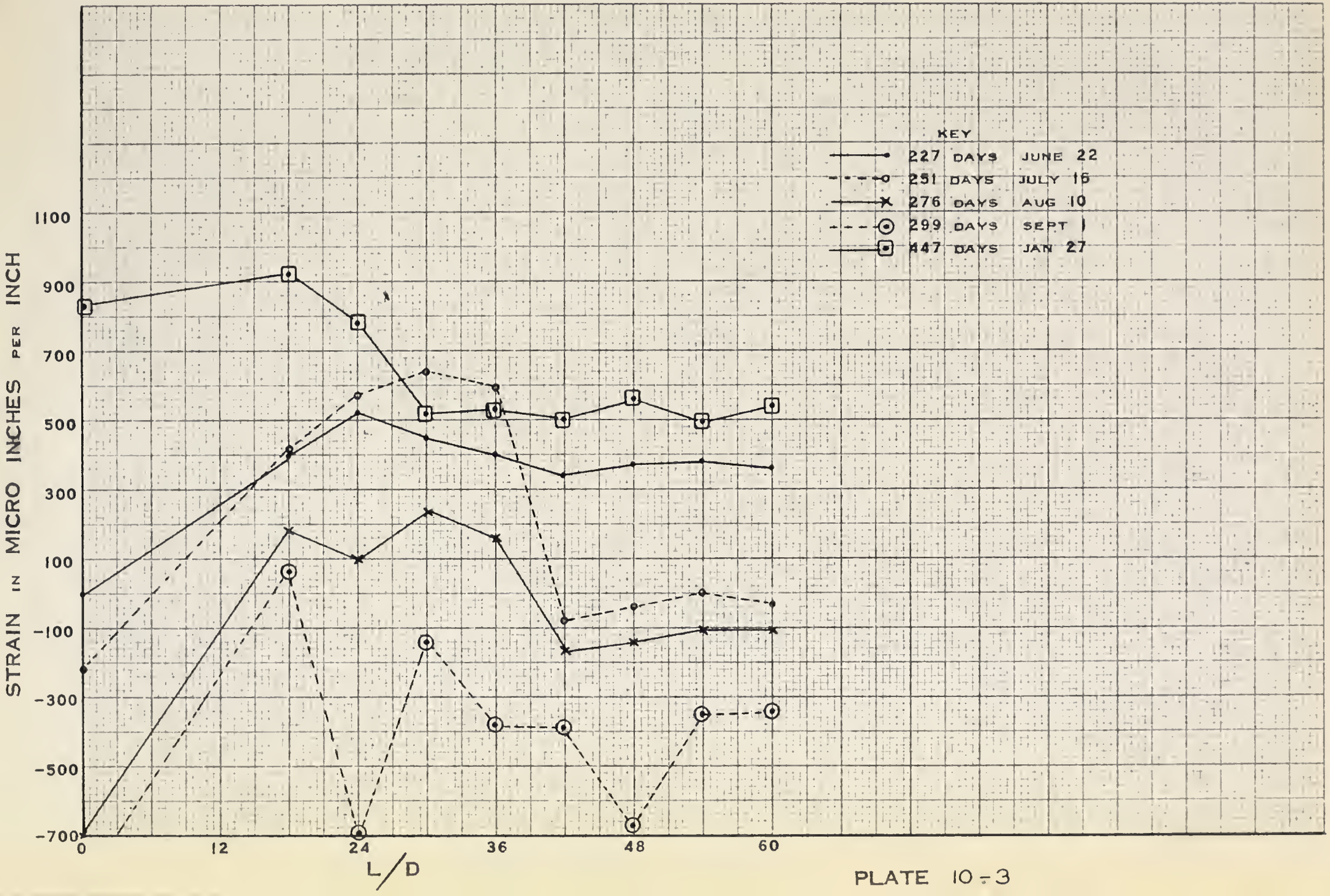


PLATE 10-3

STRAIN – TEMPERATURE CURVE

SECTION TYPE A – 6 LOCATION X STATION 262+50

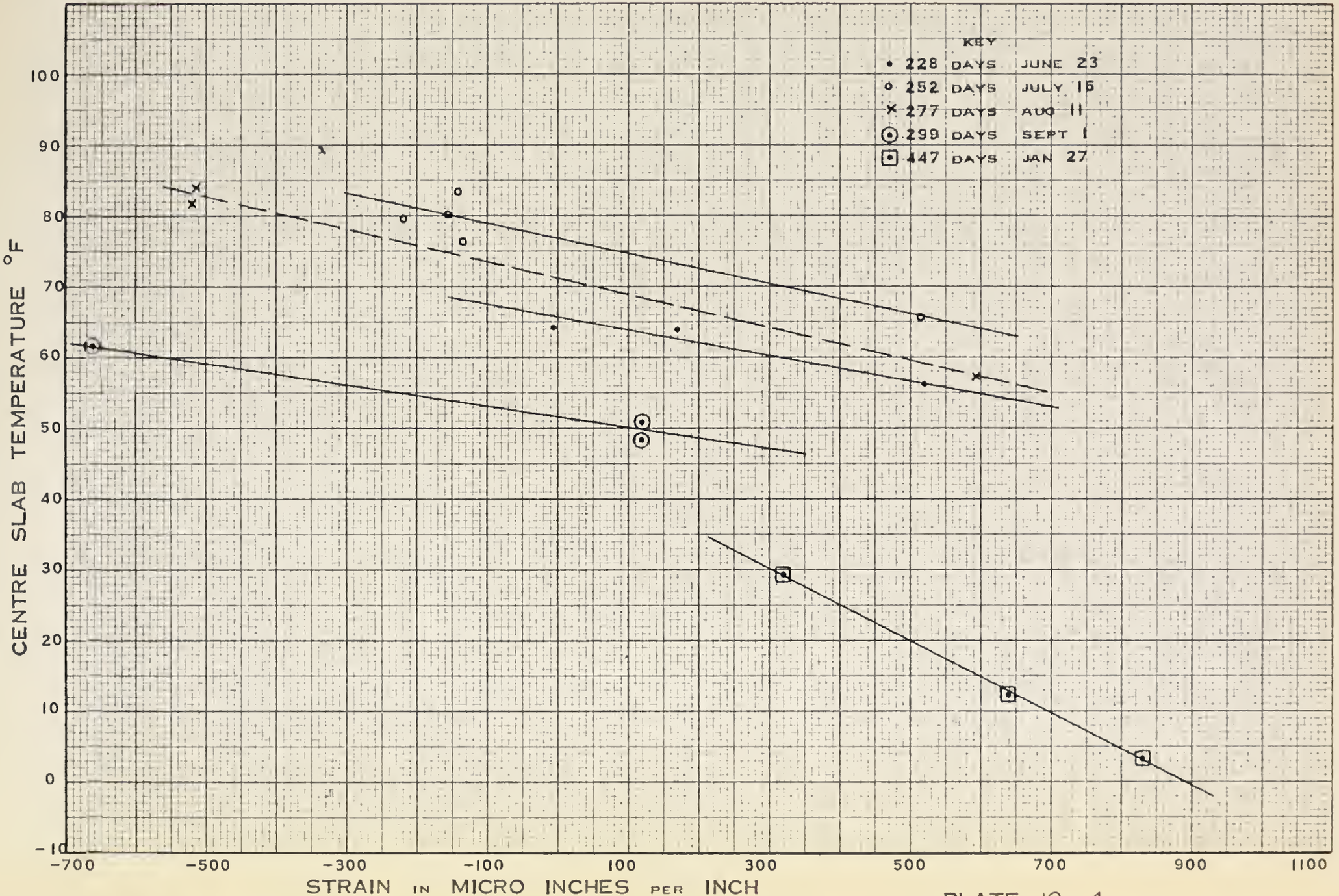


PLATE 10 – 4

CRACK WIDTH – TEMPERATURE CURVE

SECTION TYPE A – 6 LOCATION X STATION 262+50

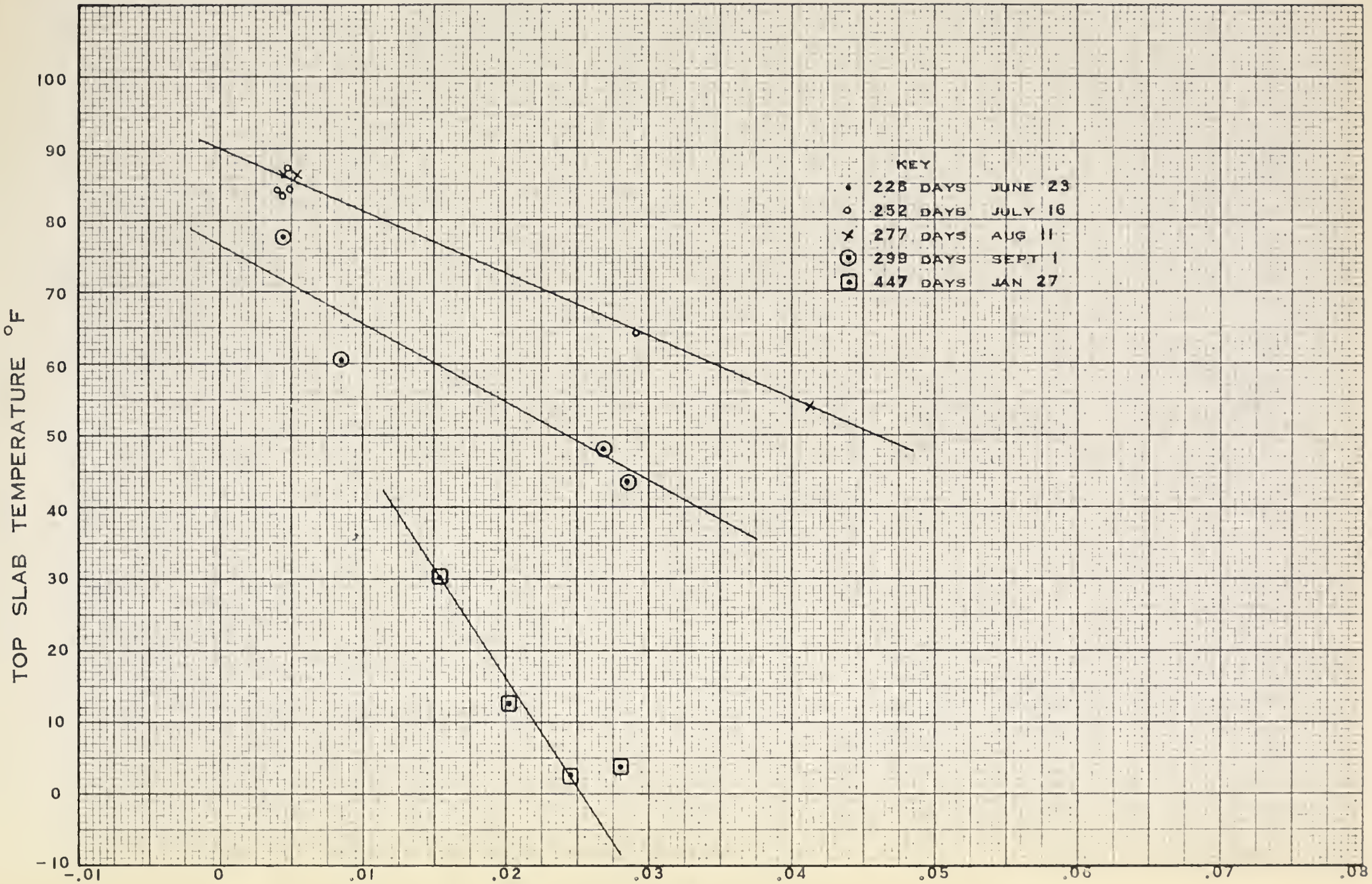


PLATE 10-5

STEEL STRAIN – CRACK WIDTH CURVE

SECTION TYPE A – 6 LOCATION X STATION 262+50

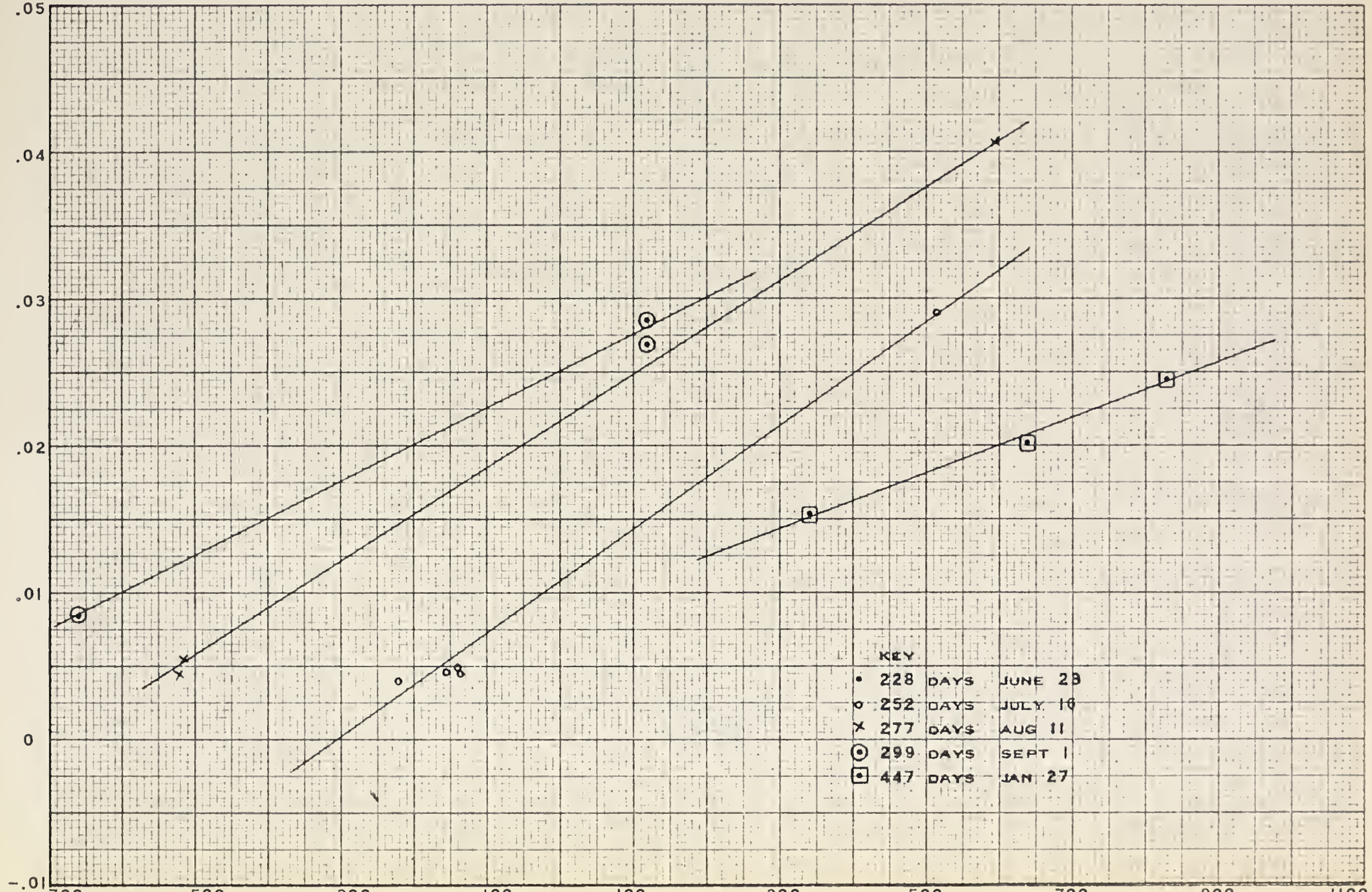


PLATE 10-6

GAGE POSITIONS

SECTION TYPE A-6 LOCATION X STATION 262+50

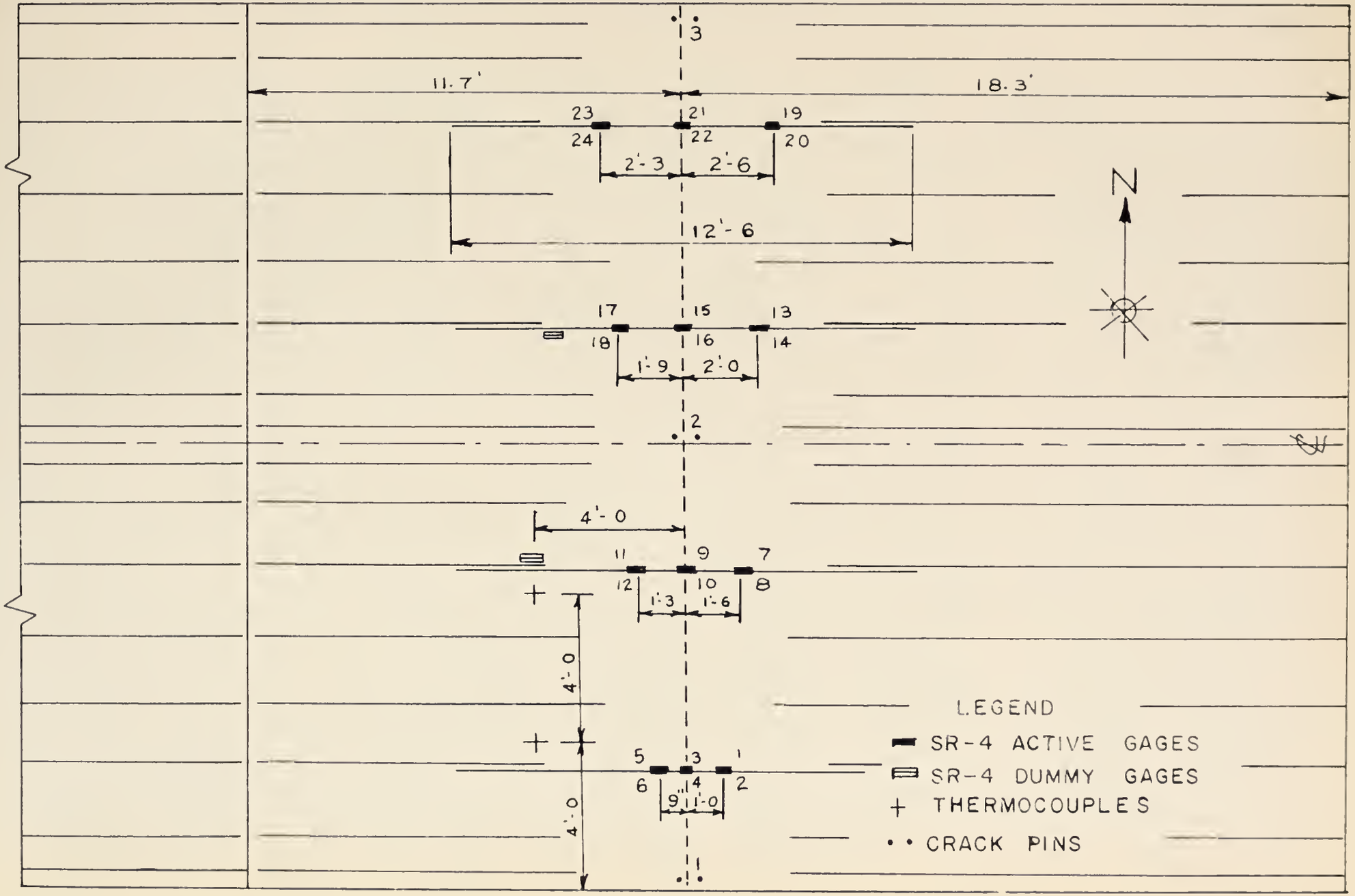


PLATE 10-7

2. Section Type A-7

This pavement type is 3090 feet long, 7 inches thick and longitudinally reinforced with No. 4 intermediate grade deformed steel bars. The reinforcing comprises 0.159% of the cross-sectional area of the pavement. Load transfer joints are spaced at 30 feet. One slab was instrumented at Station 240+93 and called Location XI. Concrete was placed at 3:30 pm on May 12, 1959.

Plate II-13 shows the location of gages. Gages 11 and 18 gave faulty service when first connected so were disconnected. Placing the gage lead wires within a conduit reduced capacitance and gave excellent performance throughout the entire period when readings were obtained. A capacitor connected across the dummy gage greatly increased indicator response.

Four sets of crack width pins were installed. To give better sensitivity for temperature measurements, two copper-constantan thermocouples were connected in series. One pair of thermocouples was installed 1 inch from the top of the slab, one pair was installed at the center of the slab and the third pair was installed 1 inch from the bottom of the slab. The pairs of thermocouples, placed vertically above each other, performed very satisfactorily.

Three time curves are plotted on Plate II-1. Slab temperature readings were not taken immediately following construction because the cold junction for the thermocouples had not been completed. The average slab temperature curve therefore does not begin until two days after construction. The average slab temperature stayed fairly constant for two weeks following construction. A sudden decrease occured because ambient temperature fell at this time. Following this, the average temperature increased until July, then

began to decrease gradually. The greatest daily variations in average slab temperature occurred in July. Maximum pavement temperatures were recorded in the late afternoon while minimum pavement temperatures were recorded from 4 a.m. to 6 a.m.

The concrete was sawed for the preformed crack about 6 p.m. on the day after placing. Cracking occurred a few hours later as the slab temperature decreased. According to the average crack width curve, the variation in the crack width was small for the first two months following construction. During July a two week sustained hot spell occurred. The greatest daily variation in crack width and widest crack were measured at this time. Daily variation in the crack width decreased with decreasing slab temperature. The crack opened to the same extent in January as in July, but the January range of crack opening was about half the July range.

The maximum crack opening was 0.023 inches. The crack almost closed completely during several hot afternoons.

The average strain at a crack shows a very interesting type of behavior. The maximum tensile strain increased with increasing average slab temperature then decreased with the decrease in average slab temperature. The maximum compressive strain also followed the same pattern of behavior. The range in daily variation increased with increasing slab temperature with the maximum range occurring in July when the average slab temperature was at a maximum. The range of daily variation decreased with the decrease in average slab temperature.

The maximum strain recorded in July was not exceeded until

winter and then only by about 200 micro inches per inch. The strains were far below the yield point thus verifying the assumption used in the design of distributed longitudinal reinforcing.(3)

The plot of the average strain in the steel as measured by gages 7 and 8 is typical of the strain in the steel at points away from the crack. The range of daily variation is very small. With the increase in the average slab temperature, the magnitude of the compressive strain increased while with the decrease in the average slab temperature a decrease in the compressive strain was noted. A small amount of compression was still present in January. This particular aspect of the pavement behavior can be attributed to plastic flow in the concrete under sustained stress.

The strain transfer curves on Plate II-3 also display the effect of plastic flow. Activated bond extended to a distance about 30 bar diameters away from the crack.

Strain temperature curves are plotted on Plates II-4 to II-6. The readings for any particular period plot on a different straight line than the readings for any other period with a varying slope for the strain temperature curve during each period of readings. This type of seasonal behavior is peculiar to the two conventional pavements constructed in the spring of 1959.

Plate II-7 shows the susceptibility of the steel to temperature at different average slab temperatures. The slopes of the strain temperature curves are plotted as a function of the average slab

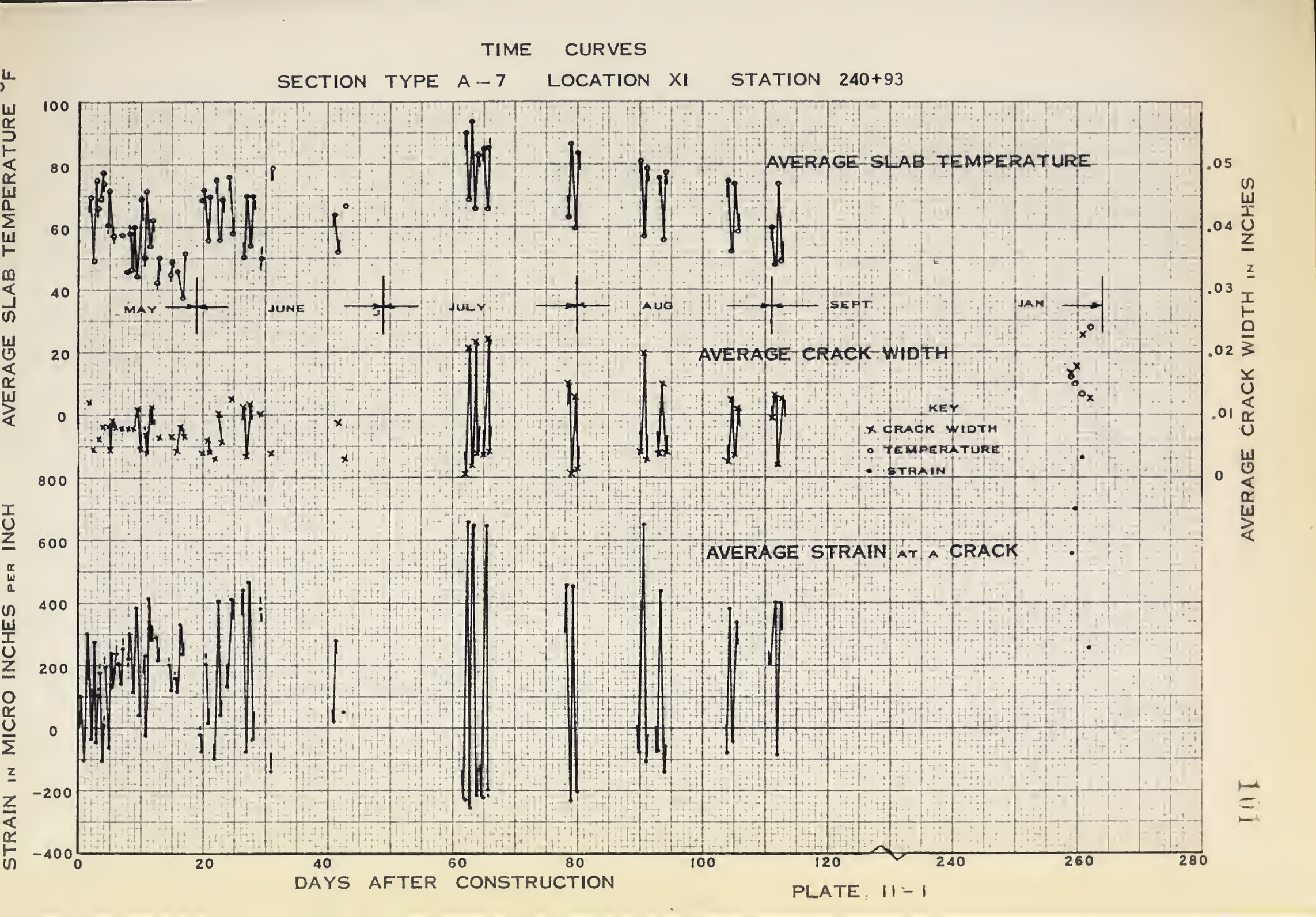
temperature for each period of readings. The average slab temperature was determined by taking the mean of the daily temperature variation for any period from the average slab temperature curve on Plate II-1. The steel was most susceptible when the average slab temperature was at a maximum. There is doubt as to whether or not the curve becomes horizontal or turns up again at low slab temperatures.

Crack width versus temperature curves are plotted on Plates II-8 to II-10. The behavior of the crack is best described by a series of straight lines for each period of readings. The slopes of the crack width versus temperature curves are variable throughout the year. A summary of these three Plates is presented on Plate II-11, where the slopes of the crack width versus temperature curve are plotted as a function of the average slab temperature. The susceptibility is greatest during the period corresponding to the maximum average slab temperature. Doubt also exists as to whether or not the curve becomes horizontal or turns up again at low average slab temperatures.

The steel strain and crack opening indicate the same type of behavior as the susceptibility. The pavement was constructed in the spring of the year which may explain this peculiar type of behavior. Plates II-7 and II-11 as well as the fact that maximum strains and widest cracks were measured during the hottest period of the year, suggest that the most critical period for a conventionally reinforced concrete pavement may be during the summer.

Plate II-12 has a plot of the steel strain at a crack as a function of the crack width. A linear relationship does not exist.

The large number of points fall within a narrow band of the plotted curve. If points for any particular period are considered, slight seasonal variation can be detected.


TIME CURVES
SECTION TYPE A – 7 LOCATION XI STATION 240+93
AVERAGE SLAB TEMPERATURE °F
STRAIN IN MICRO INCHES PER INCH
AVERAGE CRACK WIDTH IN INCHES
AVERAGE SLAB TEMPERATURE
AVERAGE CRACK WIDTH
AVERAGE STRAIN AT A CRACK
KEY
X CRACK WIDTH
o TEMPERATURE
• STRAIN
MAY
JUNE
JULY
AUG
SEPT
JAN
100
80
60
40
20
0
800
600
400
200
0
-200
-400
.05
.04
.03
.02
.01
0
0
20
40
60
80
100
120
240
260
280
DAYS AFTER CONSTRUCTION
PLATE. II-1
101

TIME CURVES

SECTION TYPE A – 7 LOCATION XI STATION 240+93

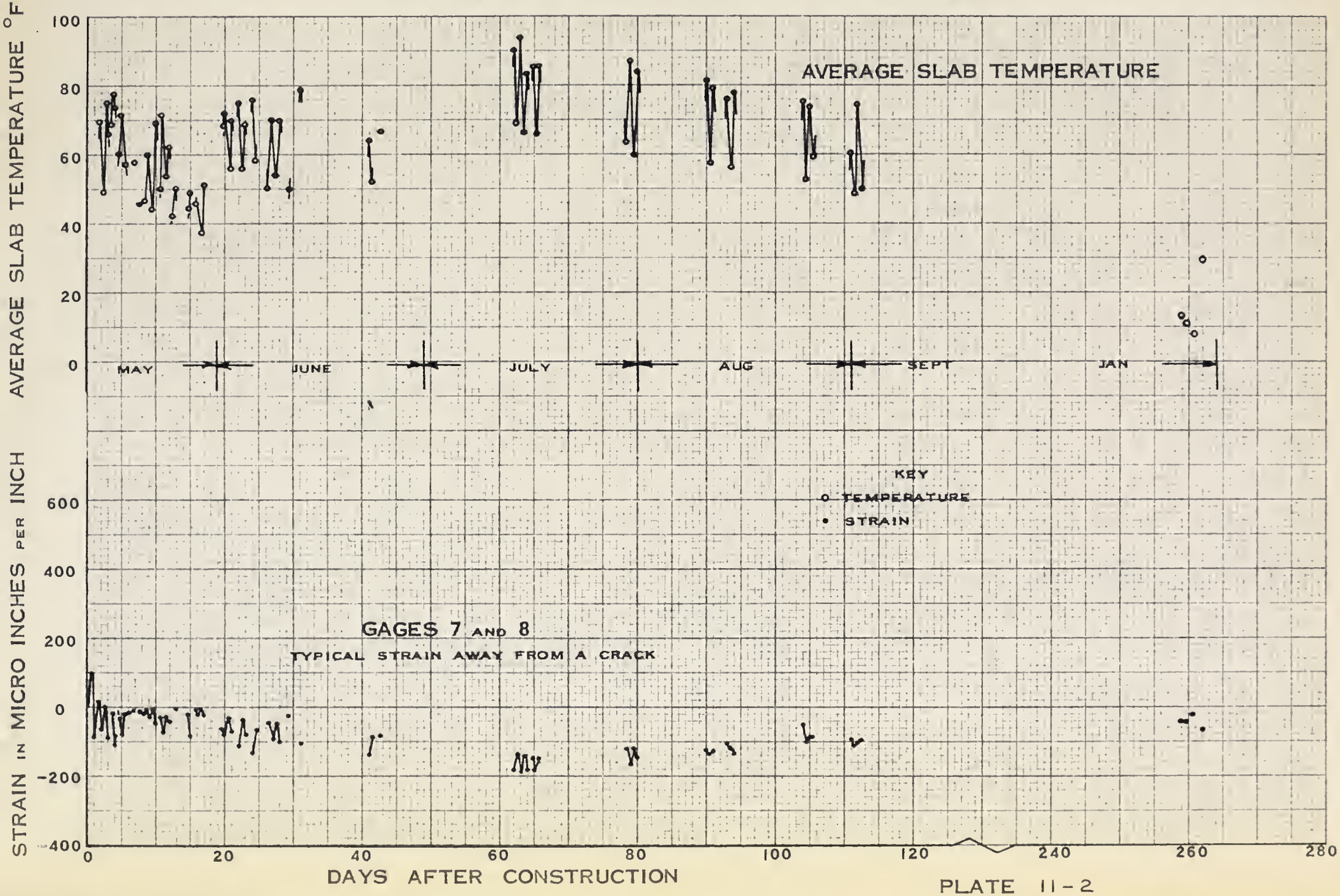


PLATE 11-2

STRAIN TRANSFER CURVES

SECTION TYPE A – 7 LOCATION XI STATION 240+93

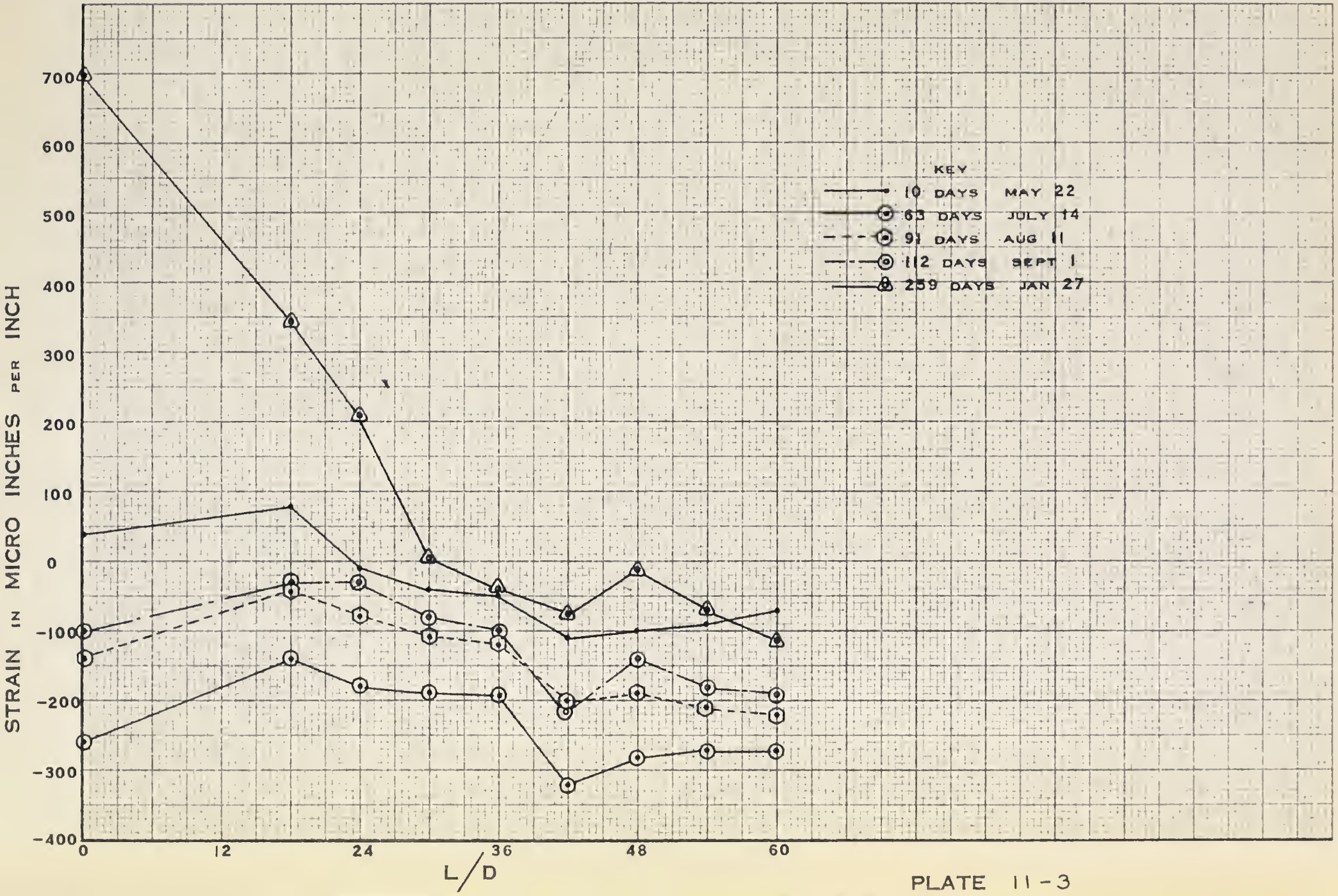


PLATE 11-3

STRAIN – TEMPERATURE CURVES

SECTION TYPE A – 7 LOCATION XI STATION 240+93

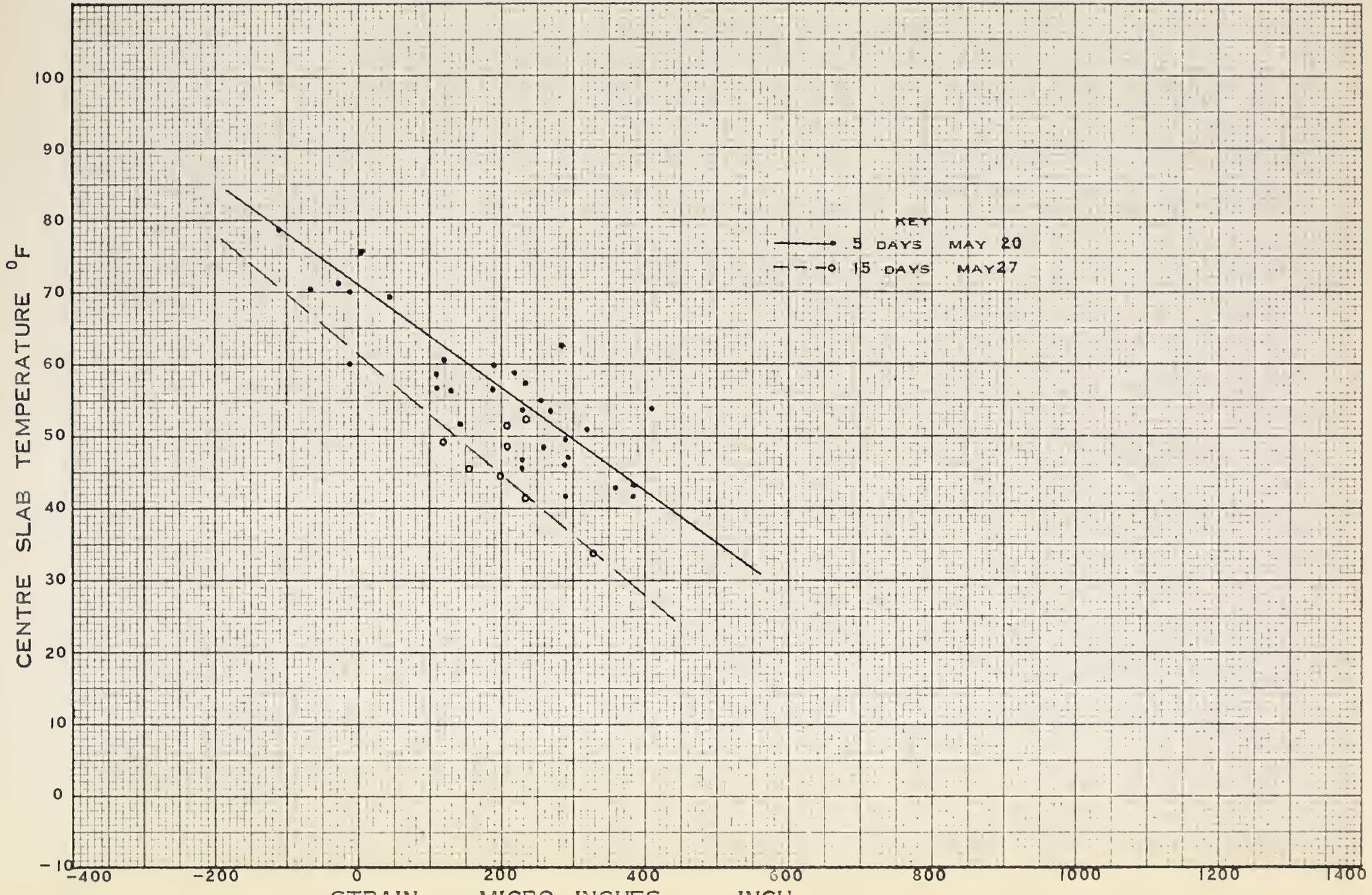


PLATE II-4

STRAIN – TEMPERATURE CURVES

SECTION TYPE A – 7 LOCATION XI STATION 240+93

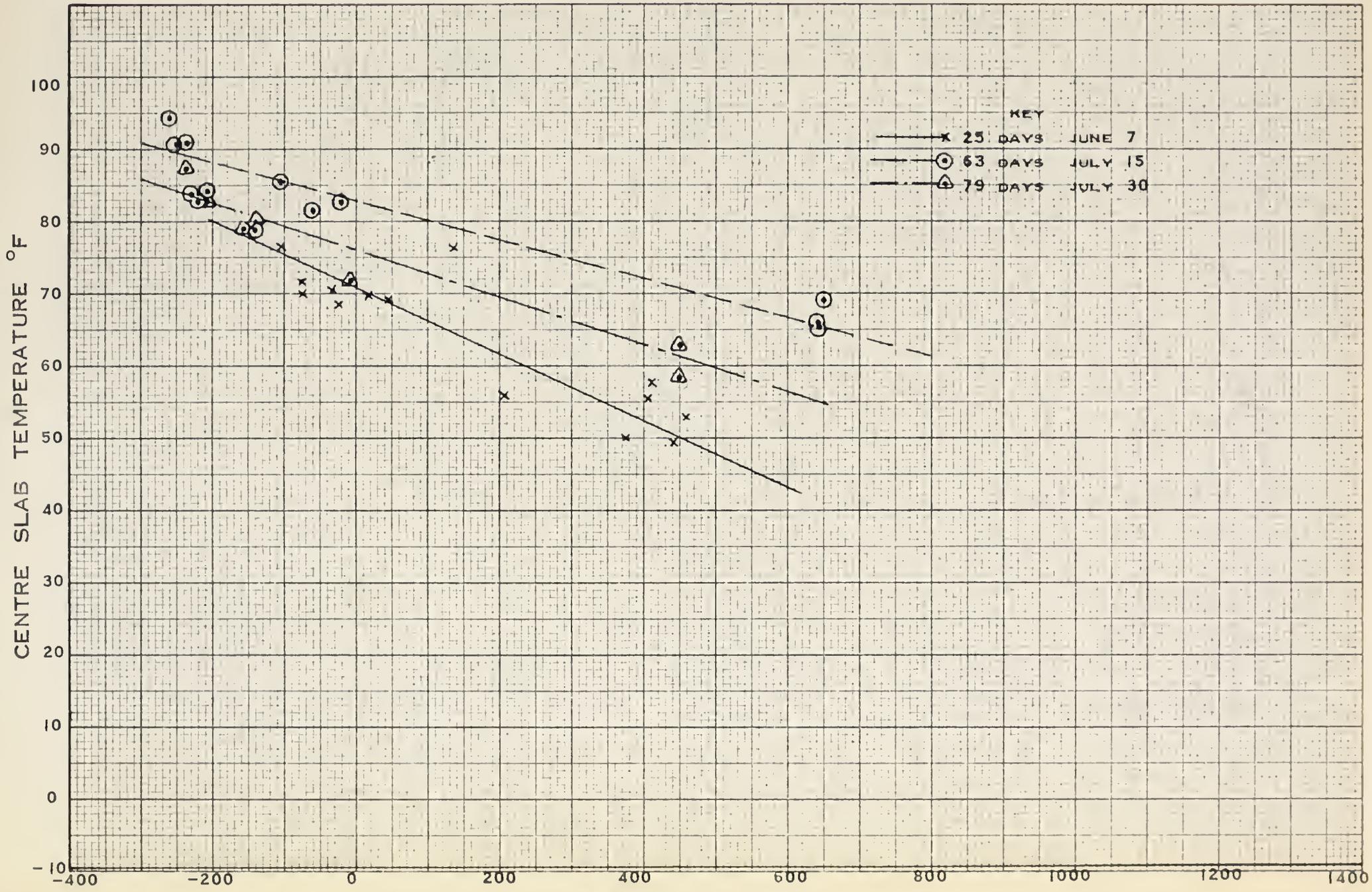


PLATE 11-5

STRAIN – TEMPERATURE CURVES

SECTION TYPE A – 7 LOCATION XI STATION 240+93

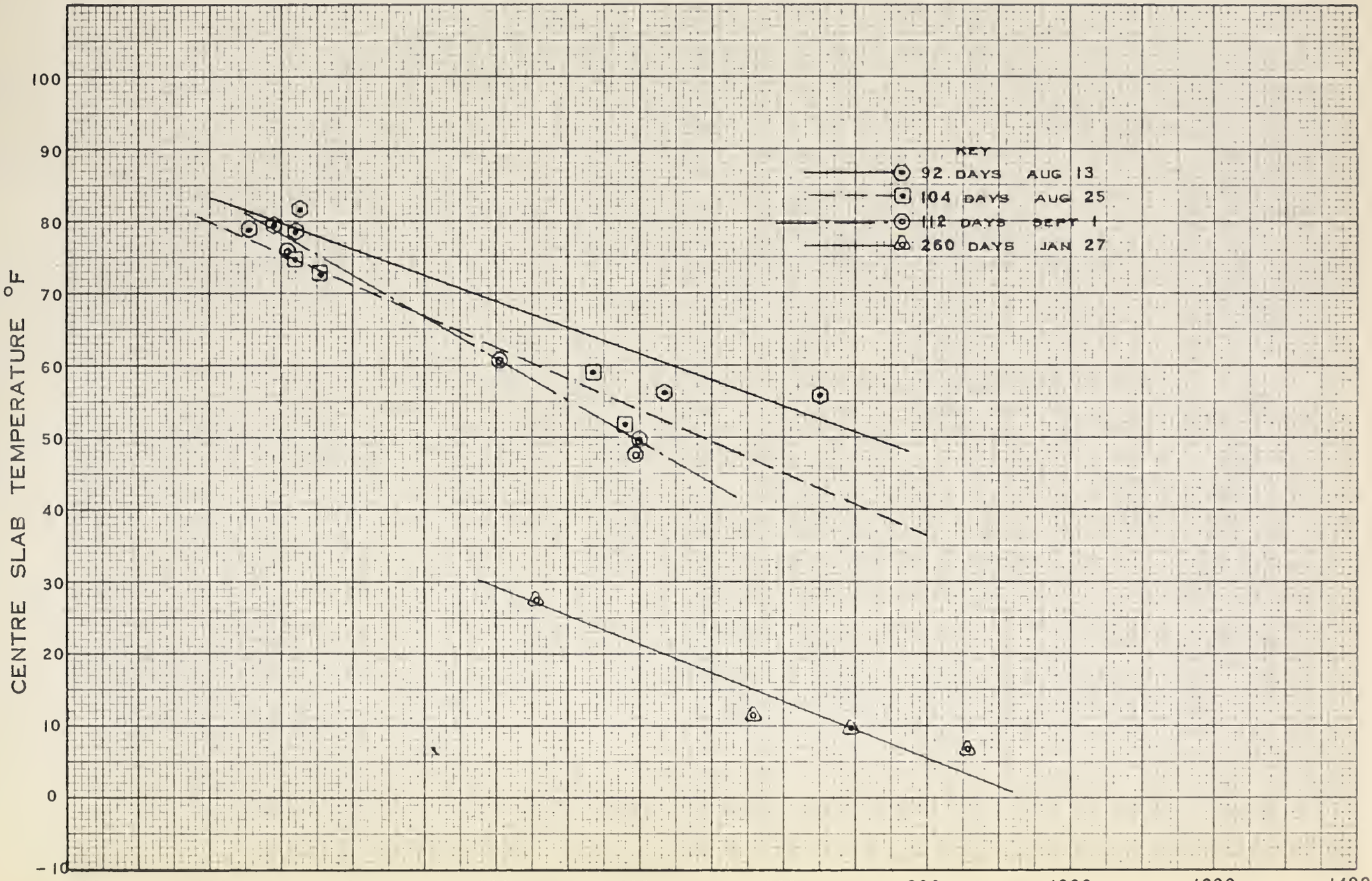


PLATE 11-6

SUSCEPTIBILITY OF STEEL WITH VARYING AVERAGE SLAB TEMPERATURE

SECTION TYPE A – 7 LOCATION XI STATION 240+93

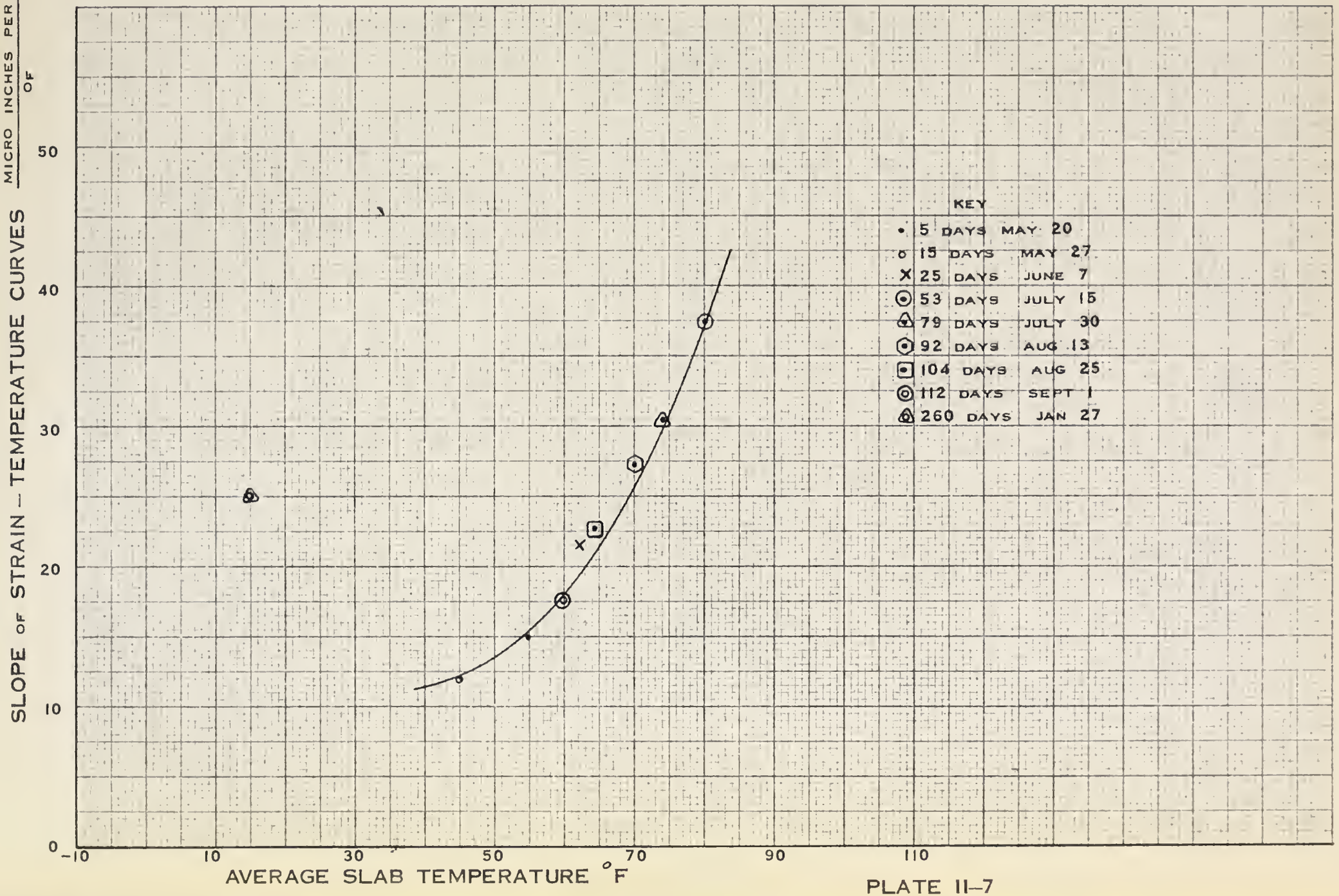


PLATE II–7

CRACK WIDTH -- TEMPERATURE CURVES

SECTION TYPE A -7 LOCATION XI STATION 240+93

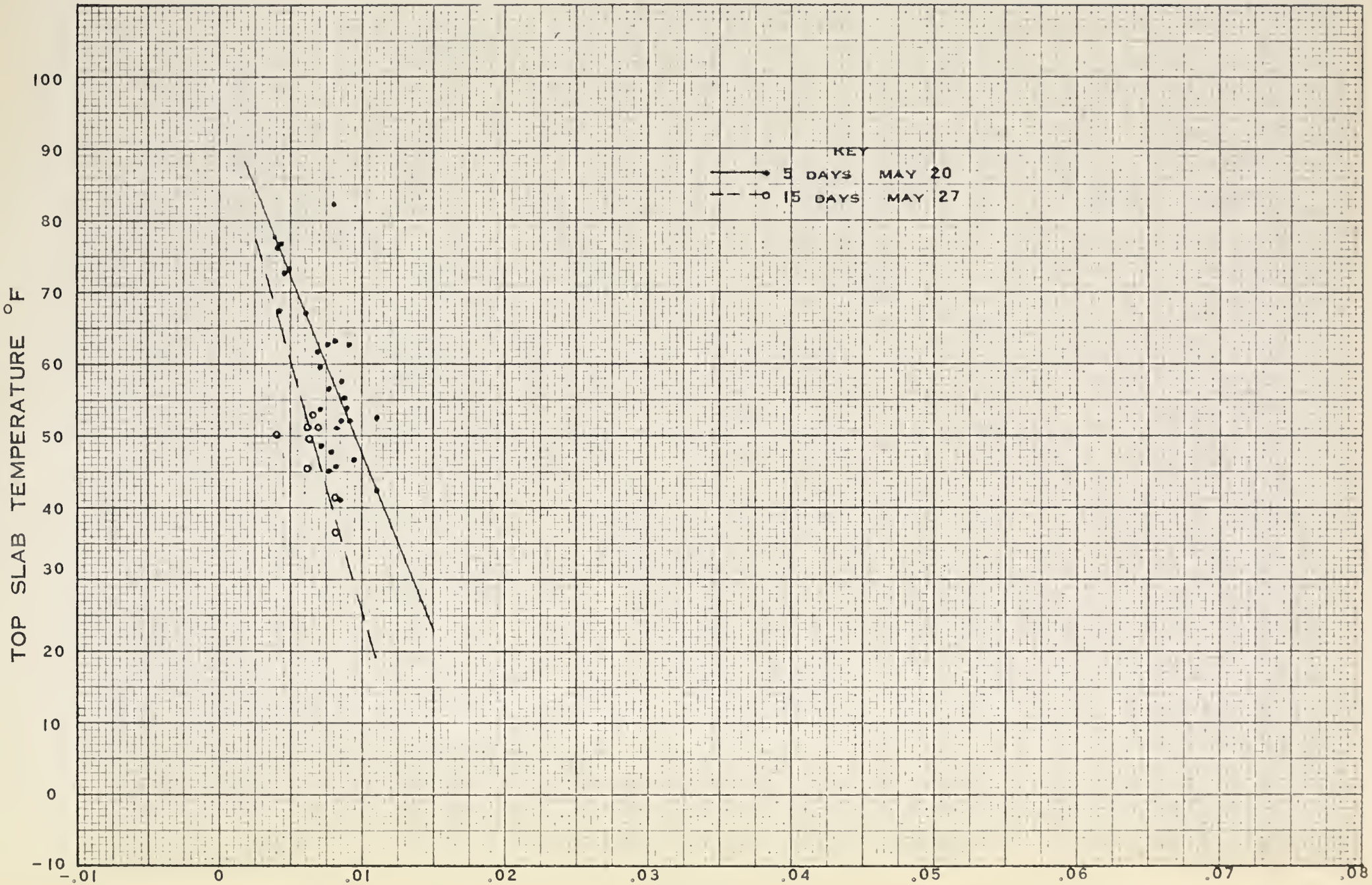


PLATE II-8

CRACK WIDTH – TEMPERATURE CURVES

SECTION TYPE A – 7 LOCATION XI STATION 240+93

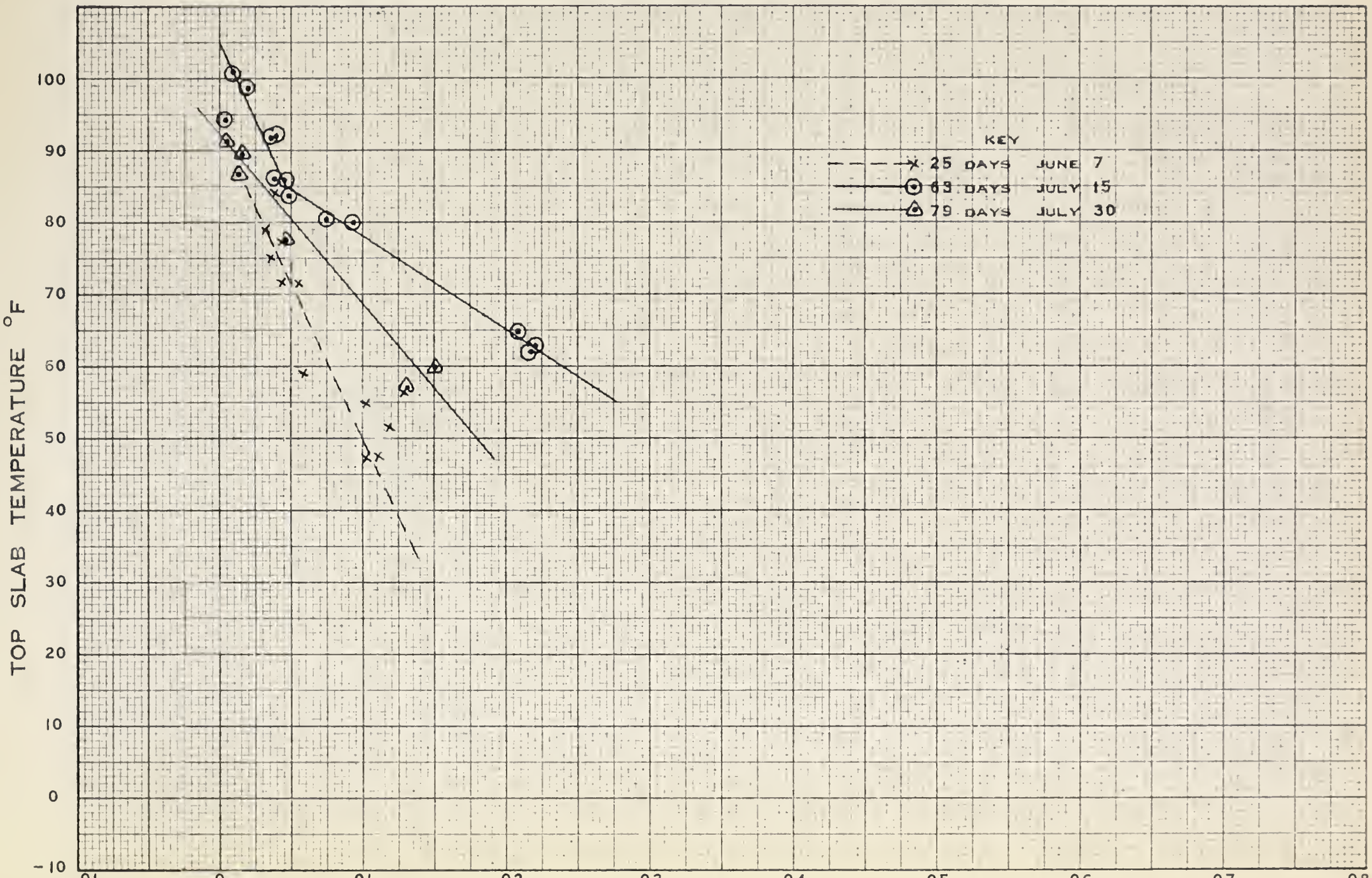


PLATE II-9

CRACK WIDTH – TEMPERATURE CURVES

SECTION TYPE A – 7 LOCATION XI STATION 240+93

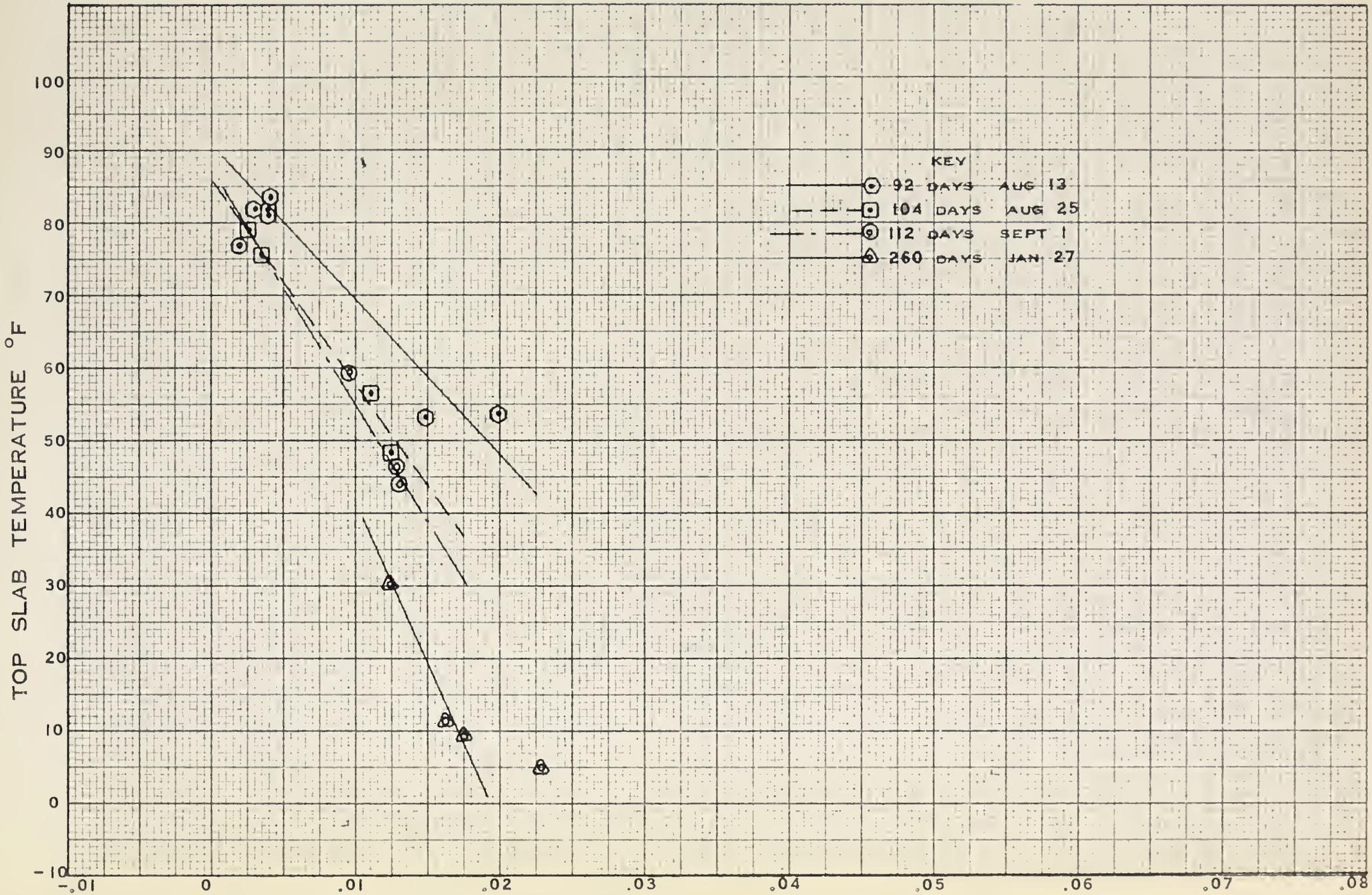


PLATE 11-10

1110

SUSCEPTIBILITY OF CRACK WIDTH WITH VARYING AVERAGE SLAB TEMPERATURE

SECTION TYPE A – 7 LOCATION XI STATION 240+93

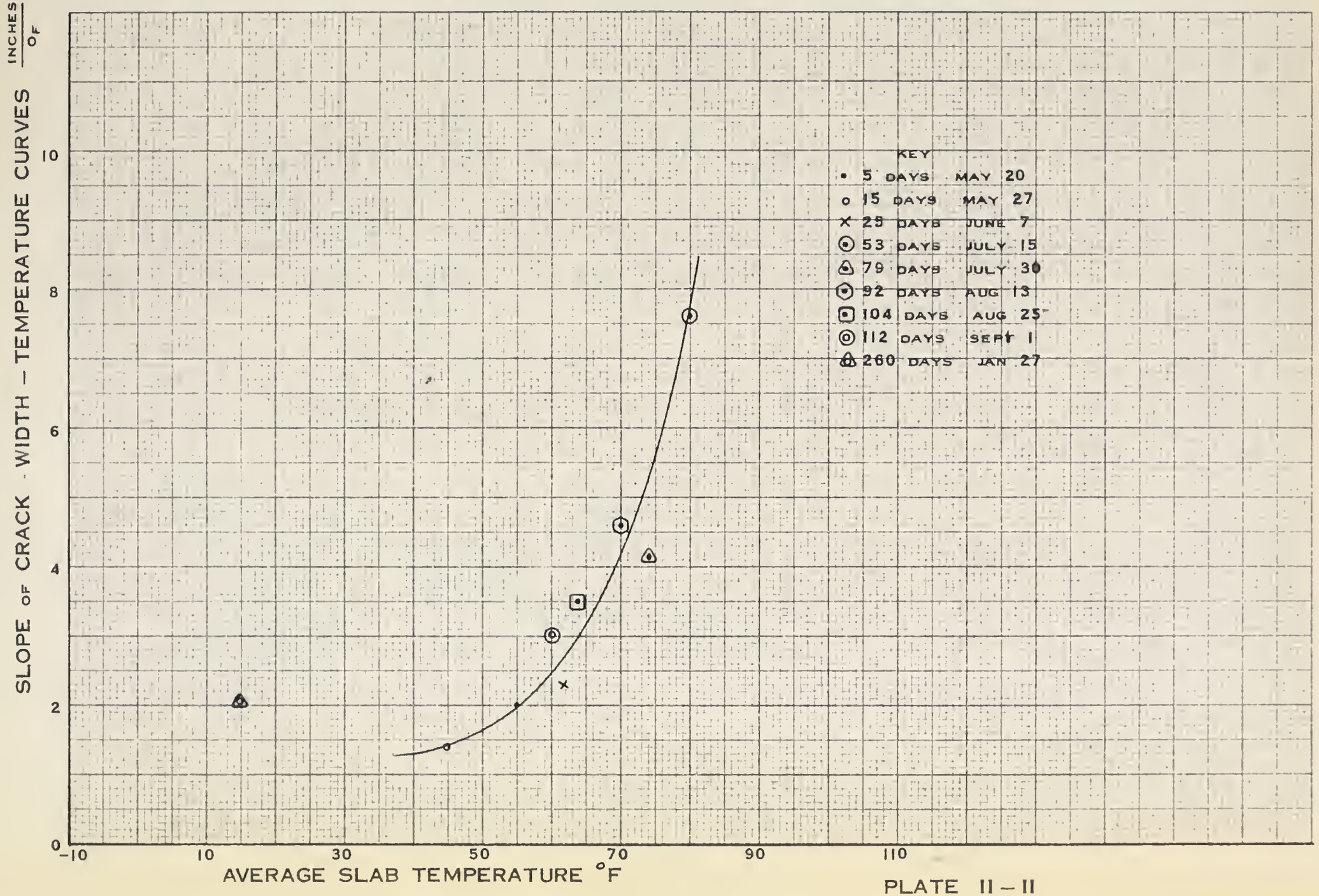


PLATE II – II

STEEL STRAIN – CRACK WIDTH CURVE

SECTION TYPE A – 7 LOCATION XI STATION 240+93

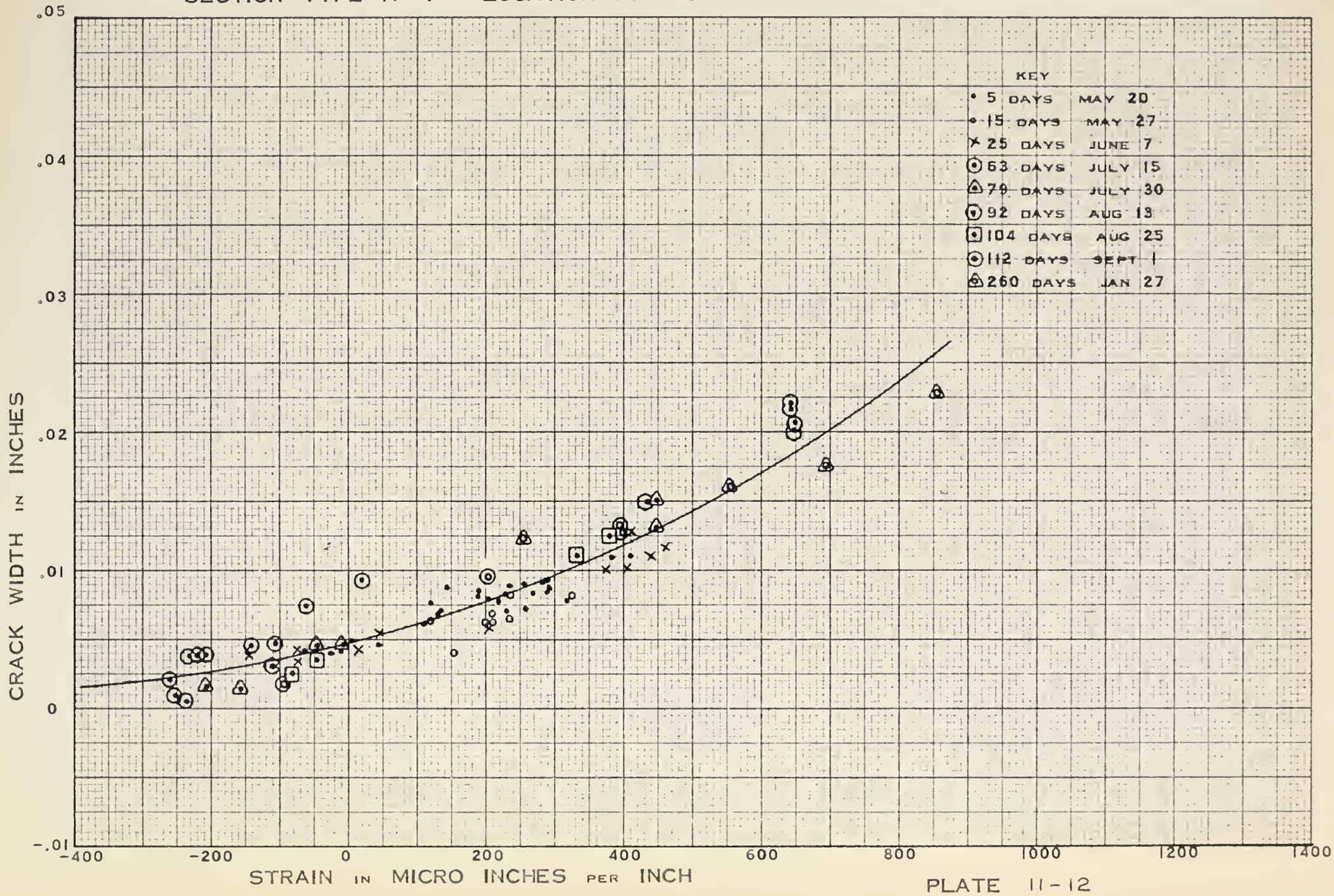


PLATE 11-12

GAGE POSITIONS IN TEST PANEL XI STATION 240 + 93

SECTION TYPE A-7

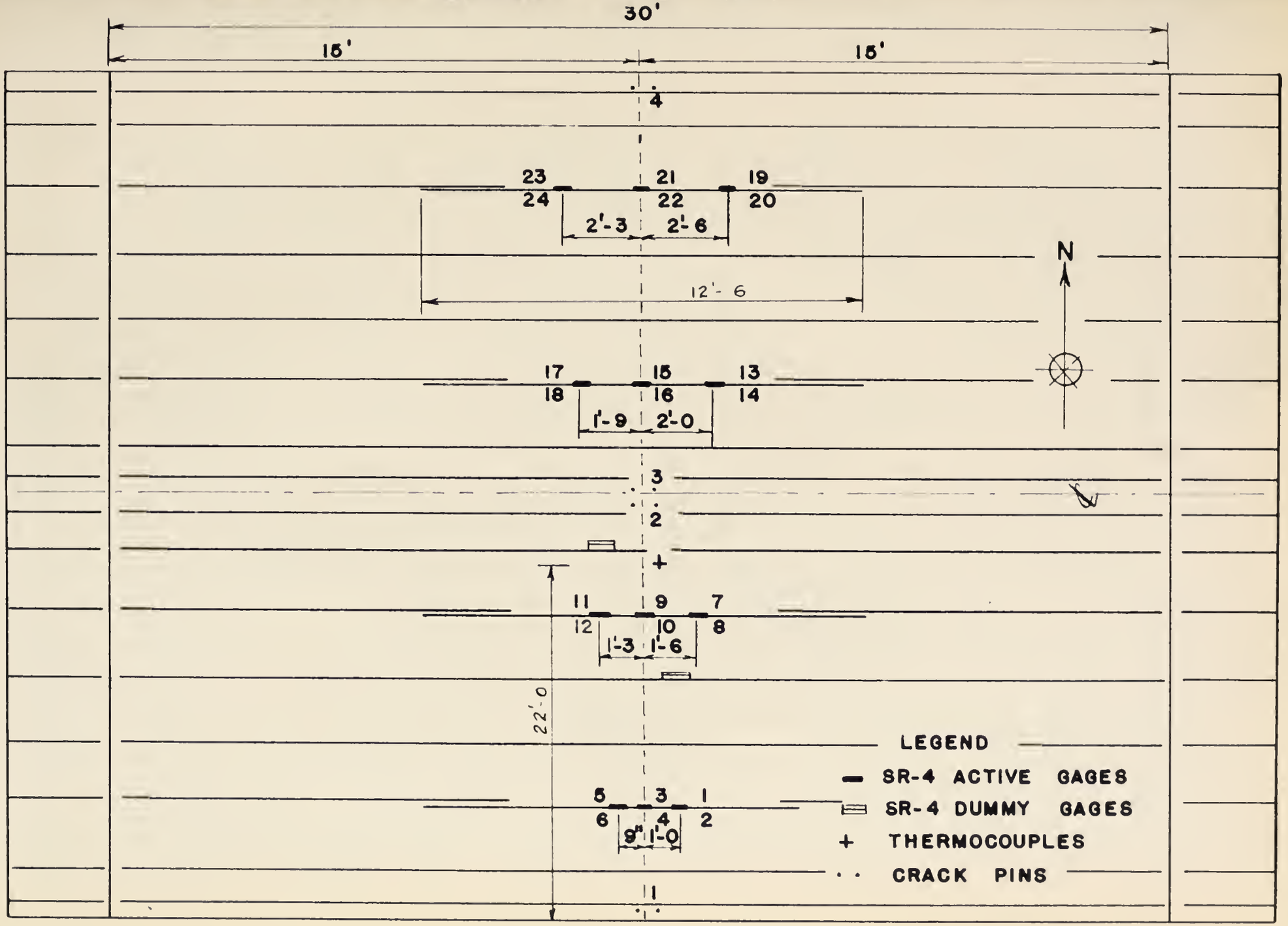


PLATE 11-13

3. Section Type A-8

The A-8 type pavement was poured in two sections separated by the Bow River. The west section is 3510 feet long while the east section is 3090 feet long. The slab is 8 inches thick and reinforced with No. 4 intermediate grade deformed steel bars. The reinforcing comprises 0.139% of the cross-sectional area of the pavement. Load transfer joints are spaced at 30 feet.

Location XII was instrumented at Station 199+53. Location of gages is shown on Plate 12-13. Gages 1, 2, 23 and 24 were faulty and were disconnected. Only two sets of crack width pins were installed. The same method of installation was used as at Location XI. Concrete was placed at 11 a.m. on May 20, 1959.

Three time curves are plotted on Plate 12-1. The average slab temperature shows a sharp decrease about five days after construction due to a snow fall at this time. Then the average slab temperature increased steadily until July when a maximum was reached. A steady decrease is noted after this period. The maximum daily variation appears to occur at the end of July.

The concrete at the preformed crack was sawed in the afternoon of the day after pouring. The crack formed a few hours later when temperatures began to drop. The daily range of crack opening was small. The maximum range occured simultaneously with the maximum average slab temperature during the middle of July. The widest crack of 0.03 inches was also measured at this time. The crack appears to close to the same limiting value throughout the entire summer.

The average strain at a crack is somewhat erratic. A strain

of 700 micro inches per inch was recorded during the first night that the concrete cracked. This same magnitude was not recorded again until January. The maximum strain recorded in January was slightly more than one half the yield point strain. The largest range of daily variation occured in July corresponding to the period of highest average slab temperature and maximum crack variation and opening. Daily variations in strain decreased in accordance with the decrease in the average slab temperature.

The maximum compressive strain increased with an increase in the average slab temperature. Following the period of maximum temperatures a decrease is noted in the maximum compressive strain.

Plate 12-2 has a plot of the average strain in the steel as measured by gages 7 and 8. This strain is typical of the strain in the steel at points away from the crack. The range in magnitude of the strain is small. The maximum range occurs at the same time as the maximum range in daily temperature.

The magnitude of the compressive strains increased with increasing average slab temperature. A decrease occurs with the decrease in the average slab temperature with tensile strains occuring in January. These effects are due to plastic flow.

The strain transfer curves on Plate 12-3 further illustrate the effects of plastic flow. Activated bond extended to a distance of 36 bar diameters away from the crack.

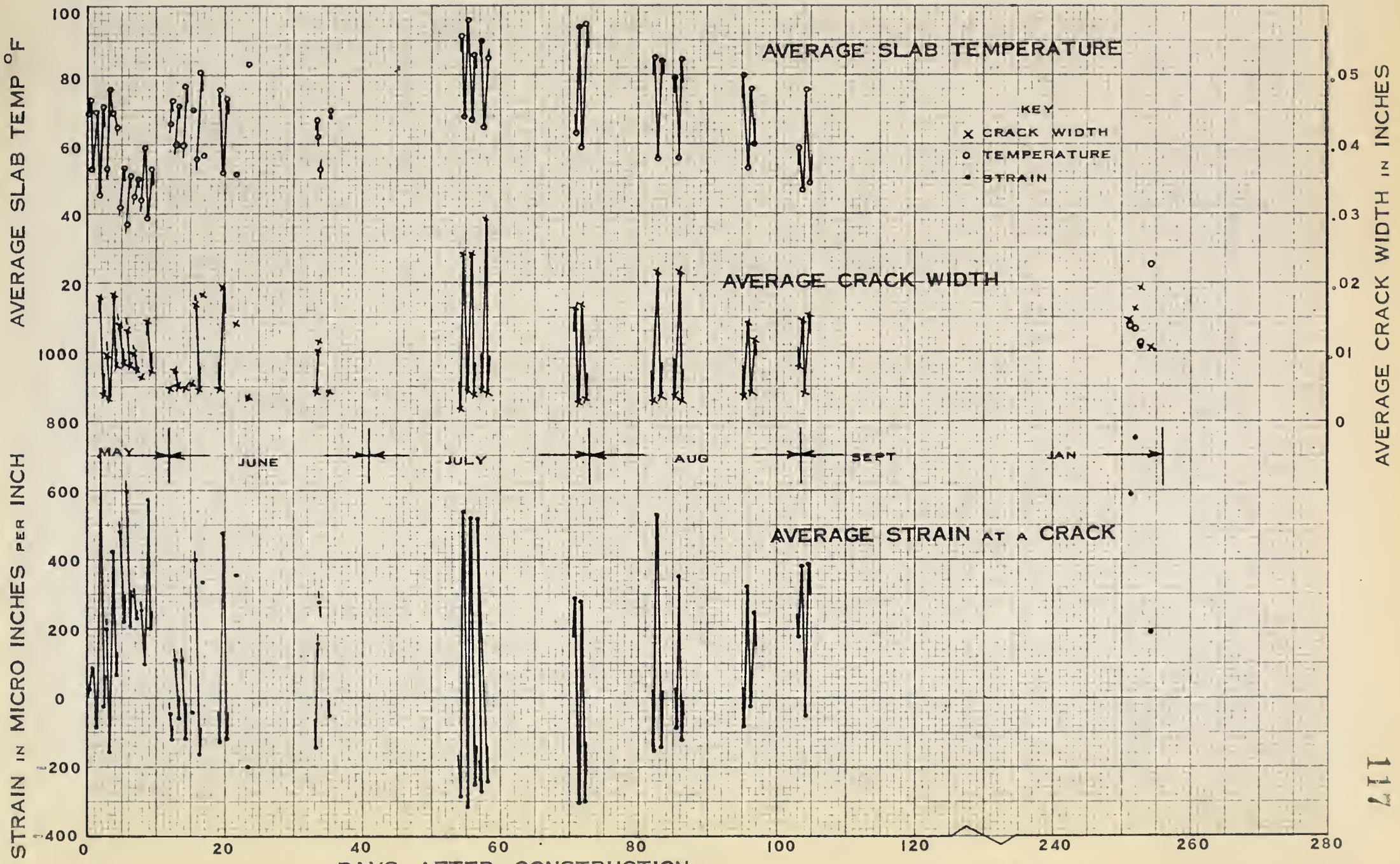
Strain temperature curves are plotted on Plates 12-4 to 12-6. A straight line relationship exists for any particular period. The slopes of the lines vary with variation in the average slab temperature. As a summary, the slopes of the strain tempera-

ture curves are plotted as a function of average slab temperature on Plate 12-7. There is a large scattering of the plotted points.

Crack width temperature curves are plotted on Plates 12-8 to 12-10. Straight line relationships exist with varying slopes for different average slab temperatures. The susceptibility of the crack width with varying average slab temperature is plotted on Plate 11-11.

The reason for this form of seasonal behavior is not evident. The only possible explanation is that this type of behavior is a characteristic of this pavement when it is constructed in the spring of the year.

The steel strain as a function of the crack width, is plotted on Plate 12-12. A straight line relationship does not exist. Considerable scatter occurs with wide crack openings. Slight seasonal variation can be detected.


TIME CURVES
SECTION TYPE A – 8 LOCATION XII STATION 199+53
AVERAGE SLAB TEMPERATURE
KEY
X CRACK WIDTH
o TEMPERATURE
• STRAIN
AVERAGE CRACK WIDTH
AVERAGE STRAIN AT A CRACK
MAY
JUNE
JULY
AUG
SEPT
JAN
AVERAGE SLAB TEMP °F
STRAIN IN MICRO INCHES PER INCH
AVERAGE CRACK WIDTH IN INCHES
DAYS AFTER CONSTRUCTION
PLATE 12 – 1

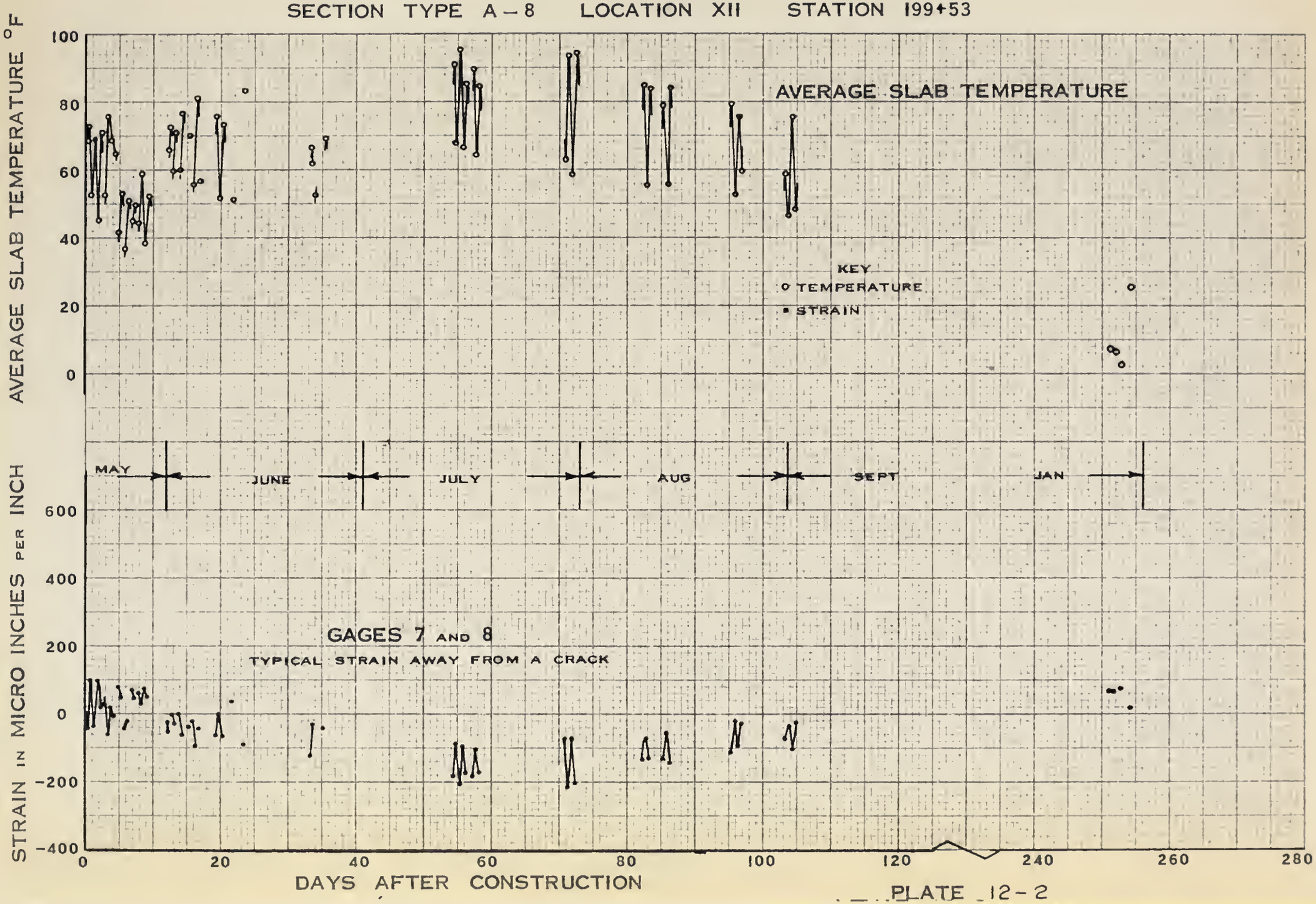

TIME CURVES
SECTION TYPE A – 8 LOCATION XII STATION 199+53
AVERAGE SLAB TEMPERATURE °F
STRAIN IN MICRO INCHES PER INCH
AVERAGE SLAB TEMPERATURE
KEY
o TEMPERATURE
• STRAIN
MAY
JUNE
JULY
AUG
SEPT
JAN
GAGES 7 AND 8
TYPICAL STRAIN AWAY FROM A CRACK
DAYS AFTER CONSTRUCTION

PLATE 12-2

STRAIN TRANSFER CURVES

SECTION TYPE A – 8 LOCATION XII STATION 199+53

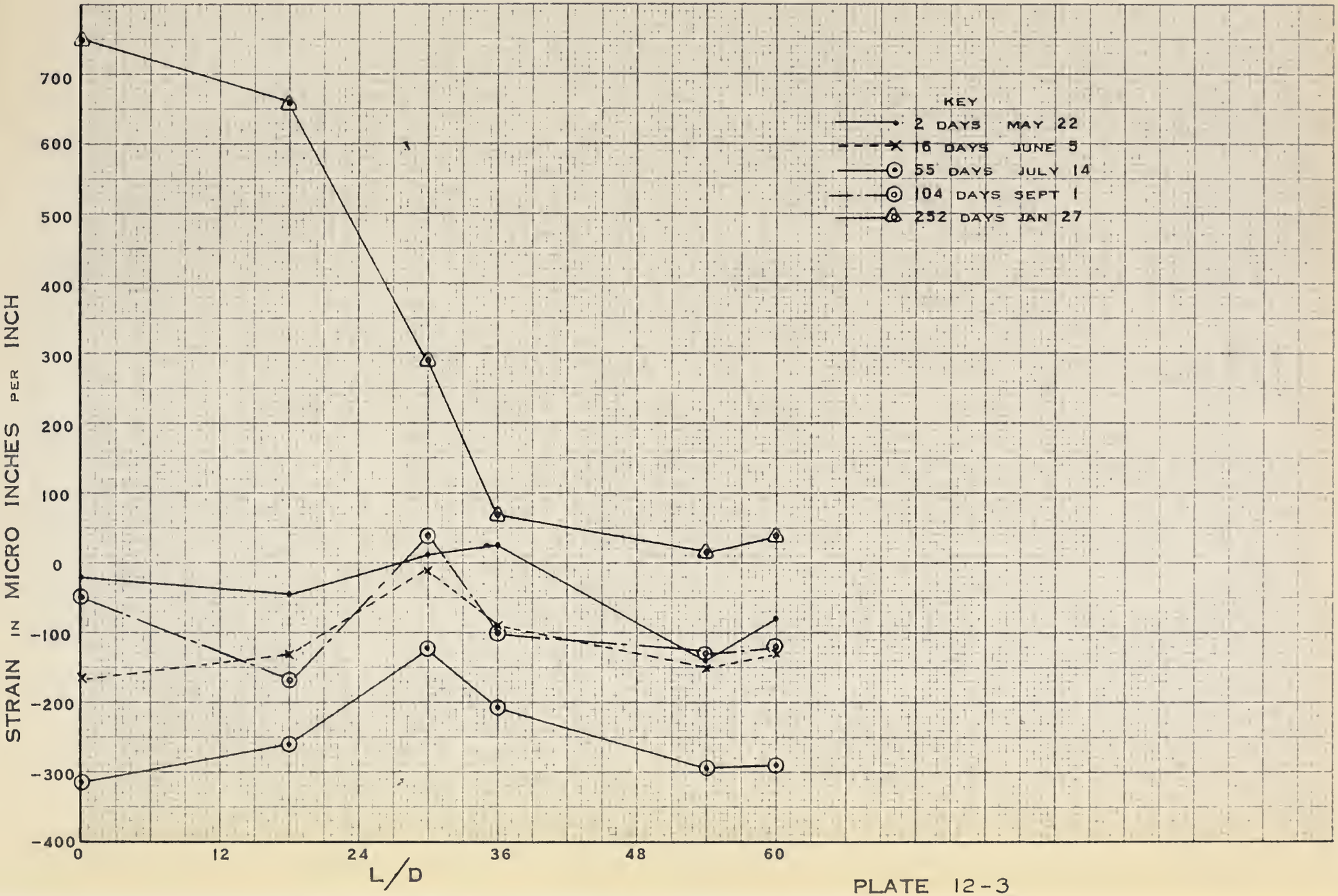


PLATE 12-3

STRAIN – TEMPERATURE CURVES

SECTION TYPE A – 8 LOCATION XII STATION 199+53

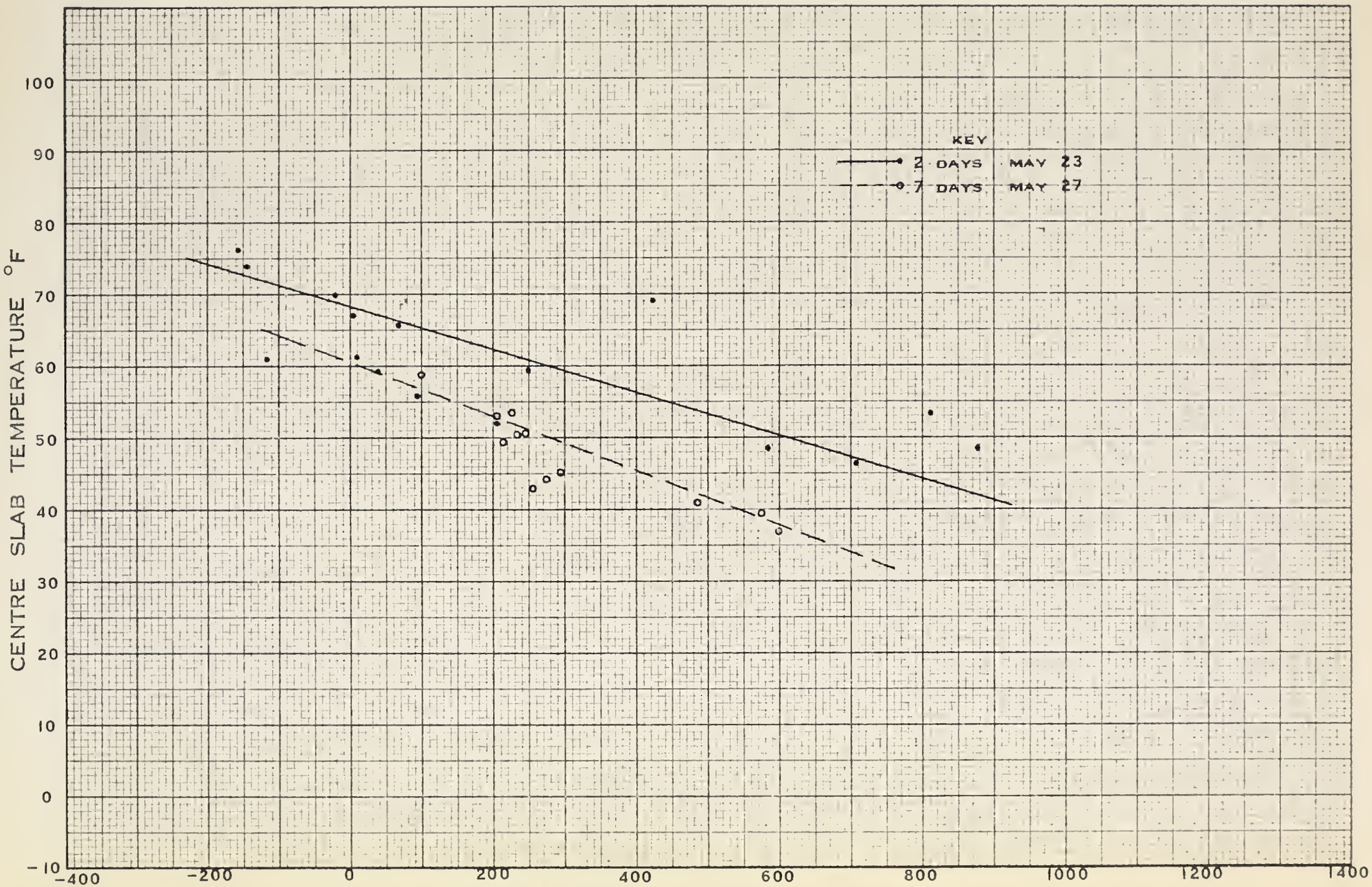


PLATE 12-4

STRAIN – TEMPERATURE CURVES

SECTION TYPE A – 8 LOCATION XII STATION 199+53

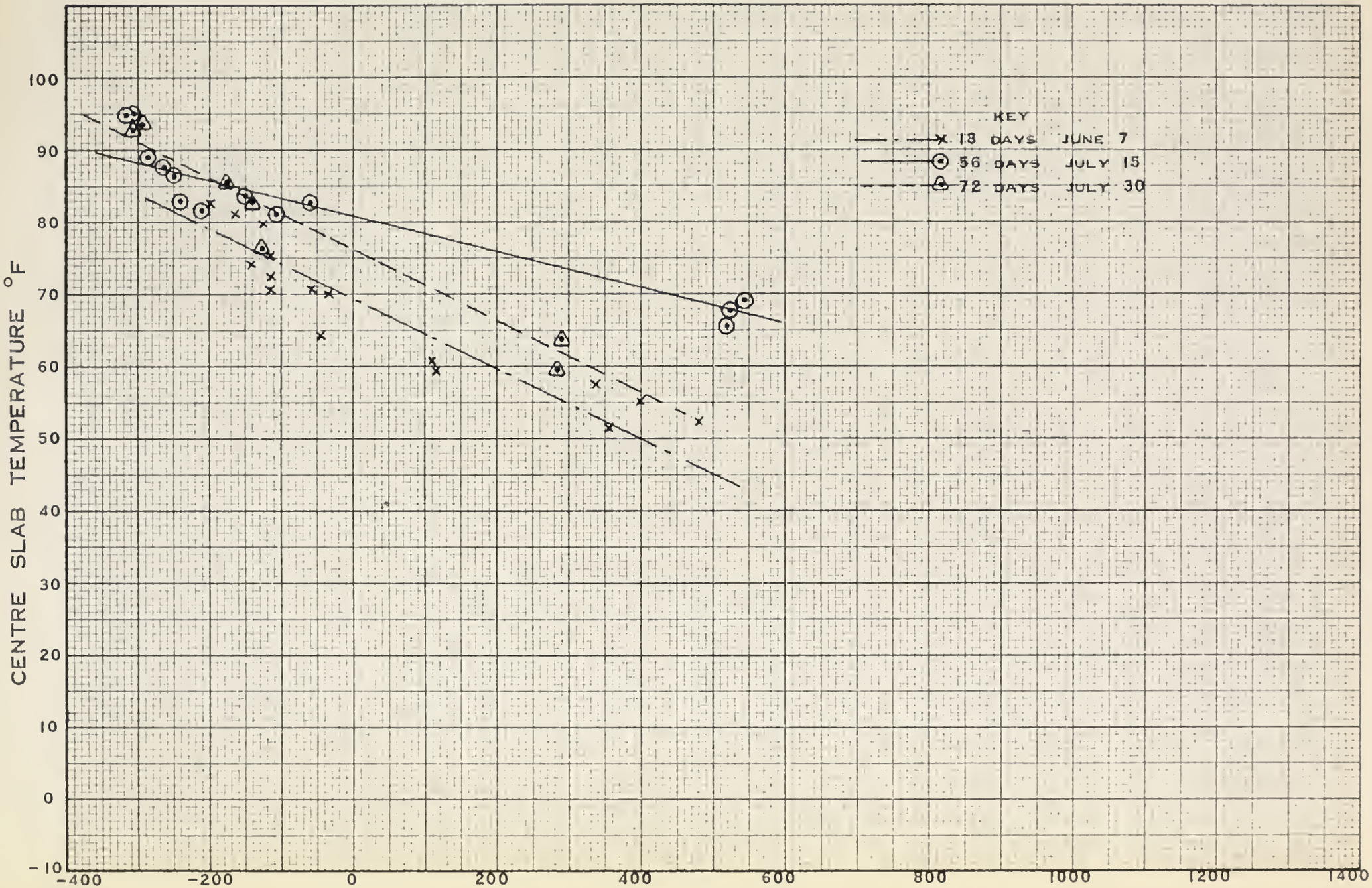


PLATE 12-5

STRAIN – TEMPERATURE CURVES

SECTION TYPE A – 8 LOCATION XII STATION 199+53

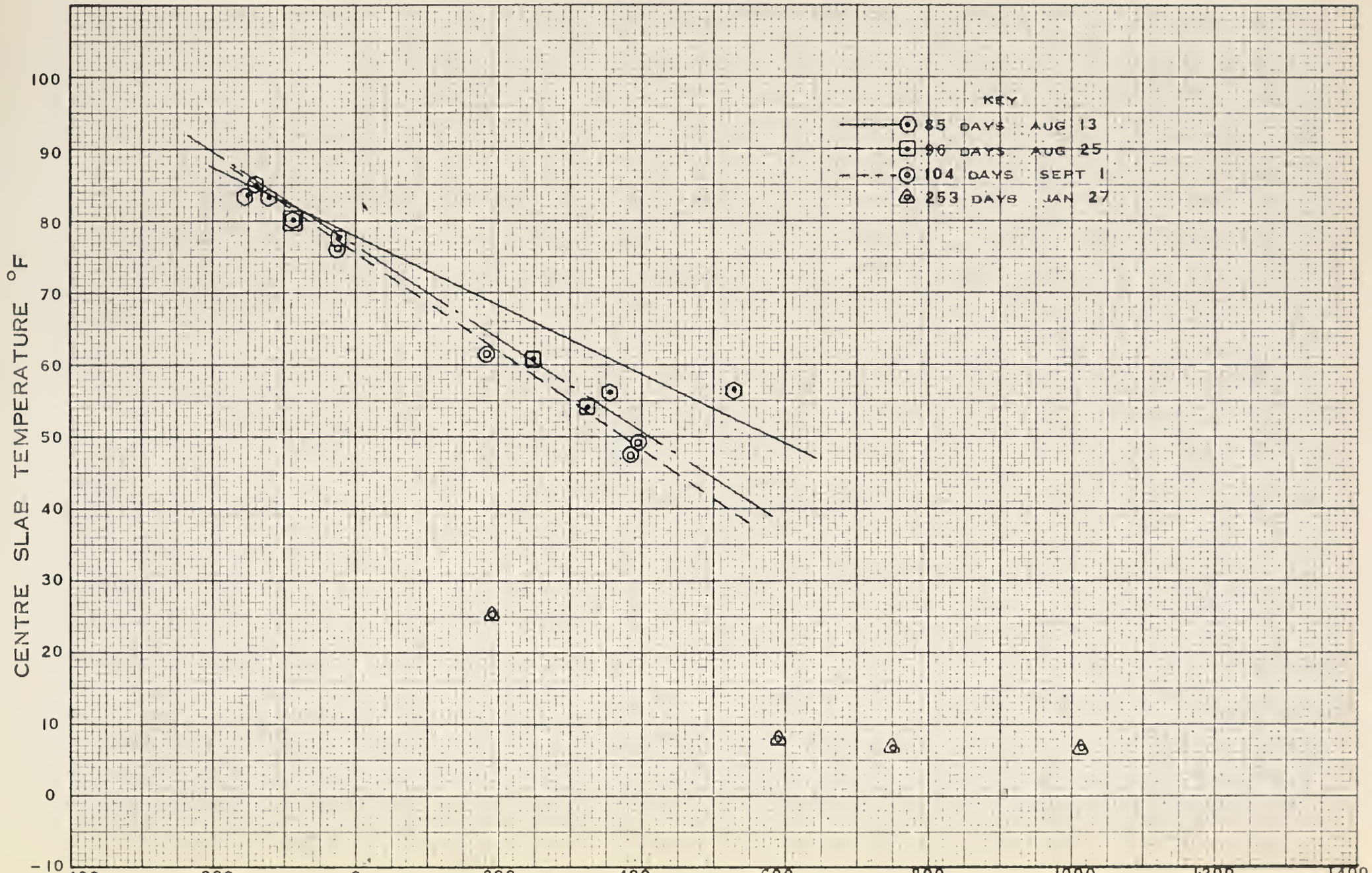


PLATE 12-6

SUSCEPTIBILITY OF STEEL WITH VARYING AVERAGE SLAB TEMPERATURE

SECTION TYPE A – 8 LOCATION XII STATION 199+53

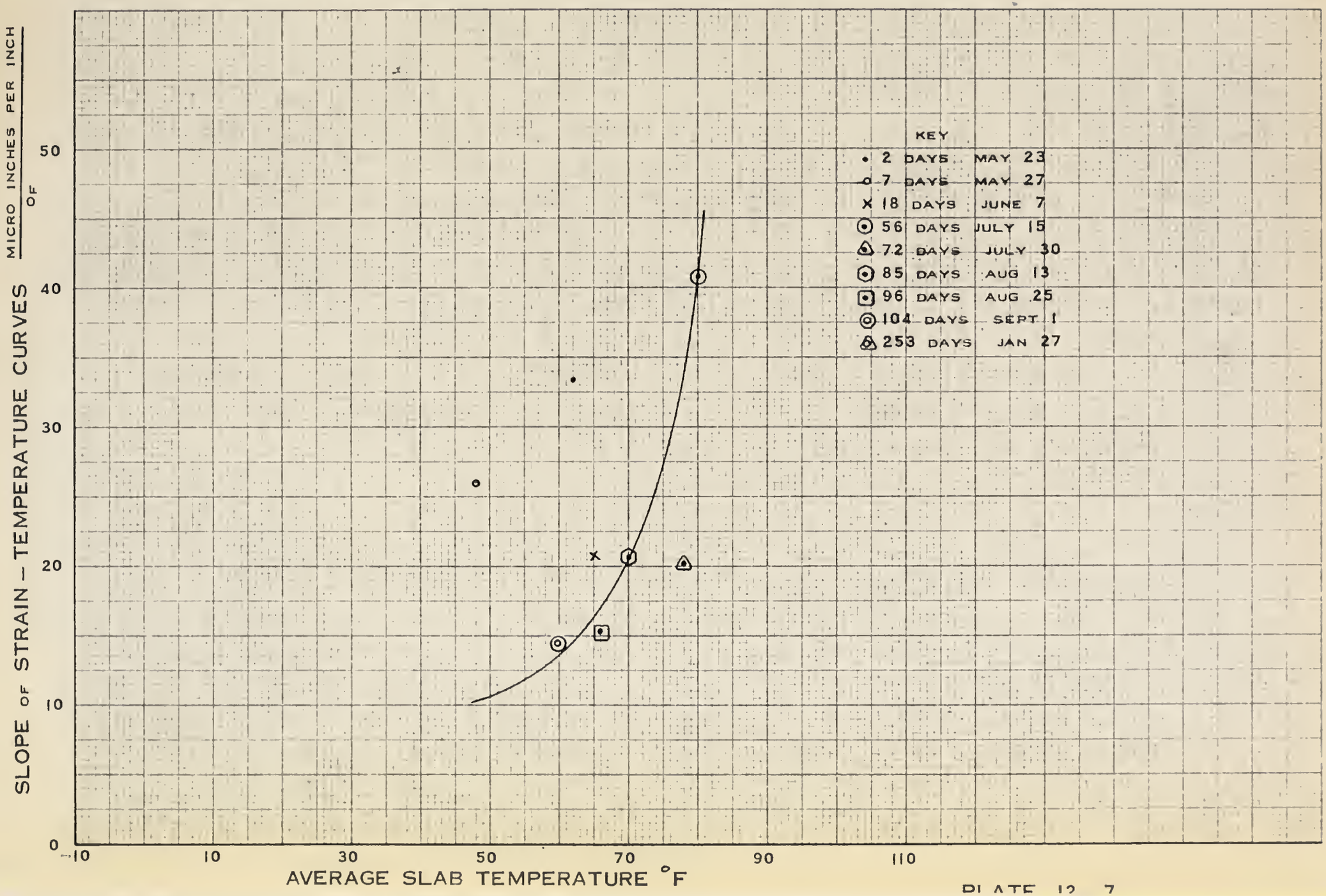


PLATE 12 7

CRACK WIDTH – TEMPERATURE CURVES

SECTION TYPE A --8 LOCATION XII STATION 199+53

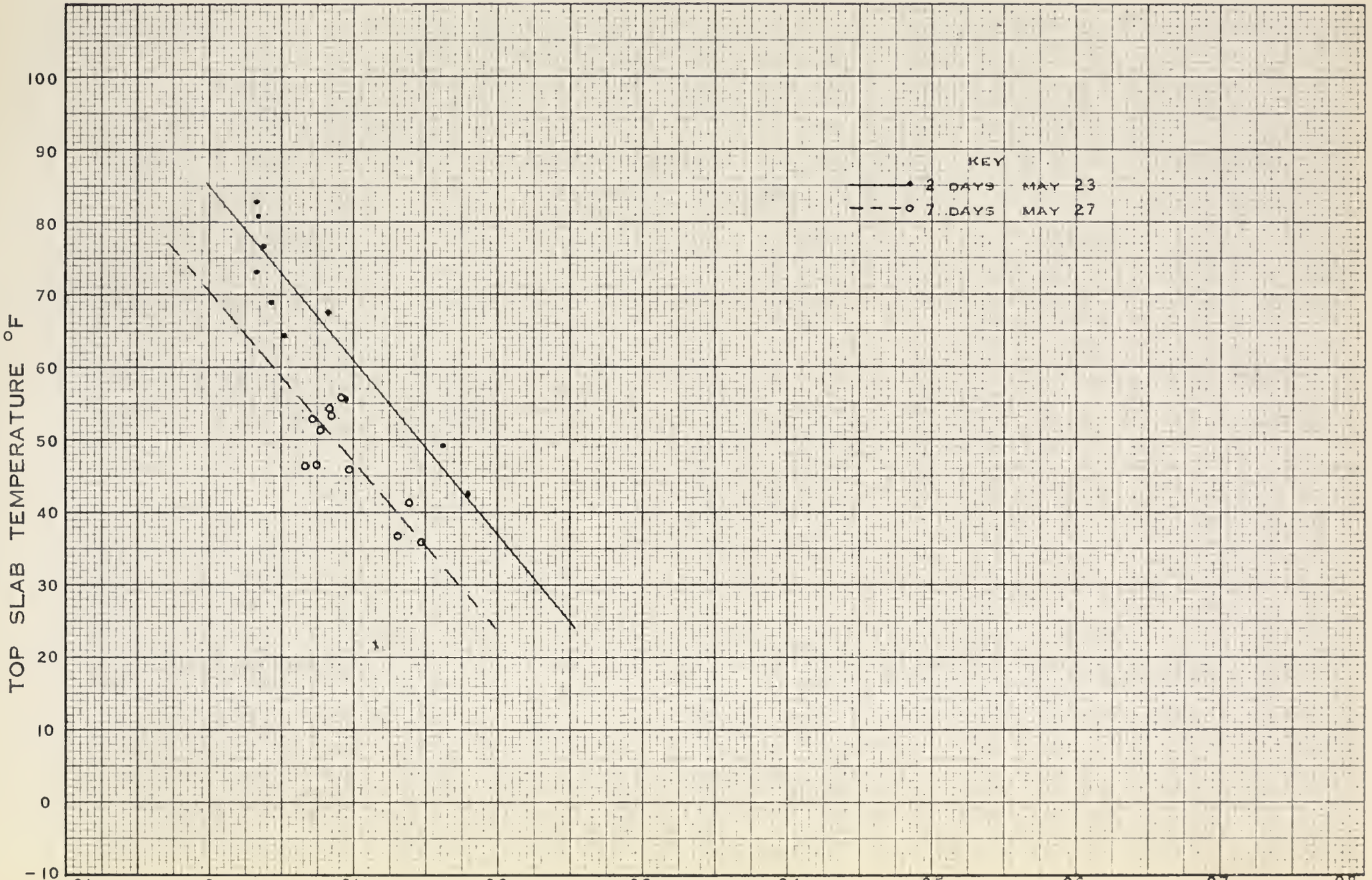


PLATE 12-8

CRACK WIDTH – TEMPERATURE CURVES

SECTION TYPE A – 8 LOCATION XII STATION 199+53

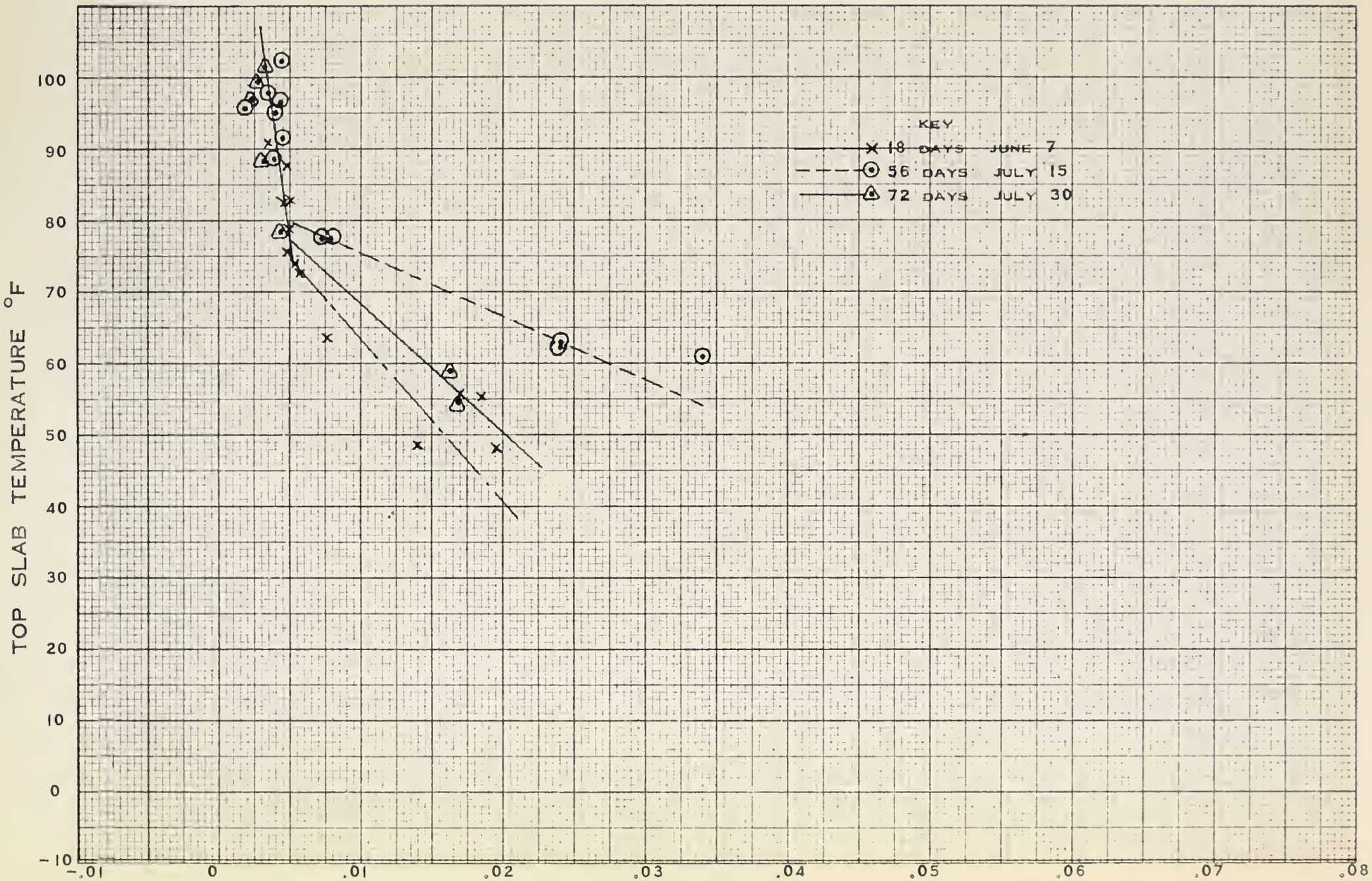
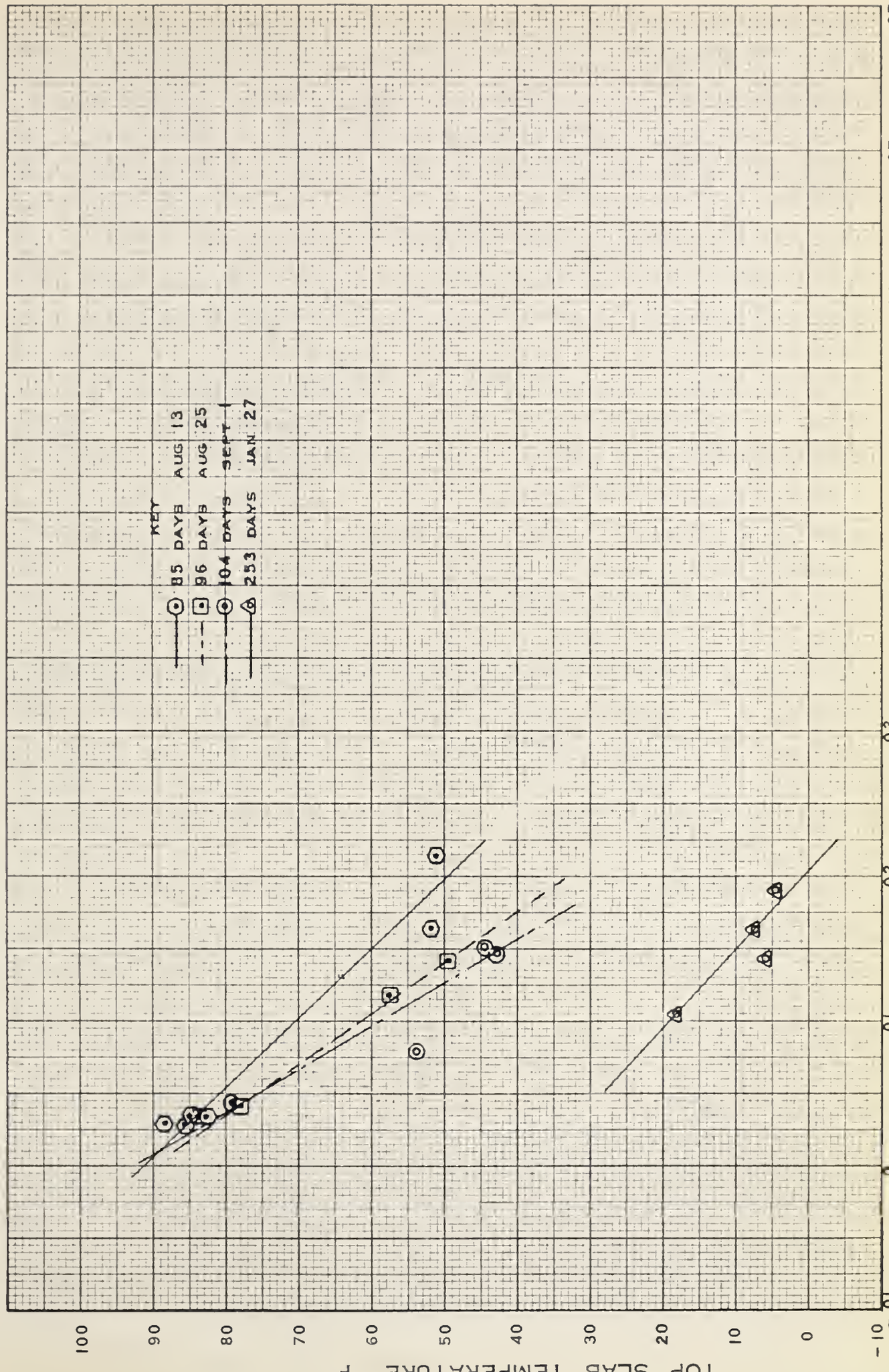


PLATE 12-9


CRACK WIDTH -- TEMPERATURE CURVES
SECTION TYPE A-8 LOCATION XII STATION 199+53
KEY
85 DAYS AUG 13
96 DAYS AUG 25
104 DAYS SEPT 1
253 DAYS JAN 27
TOP SLAB TEMPERATURE °F
AVERAGE CRACK WIDTH IN INCHES
PLATE 12-10

SUSCEPTIBILITY OF CRACK WIDTH WITH VARYING AVERAGE SLAB TEMPERATURE

SECTION TYPE A – 8 LOCATION XII STATION 199+53

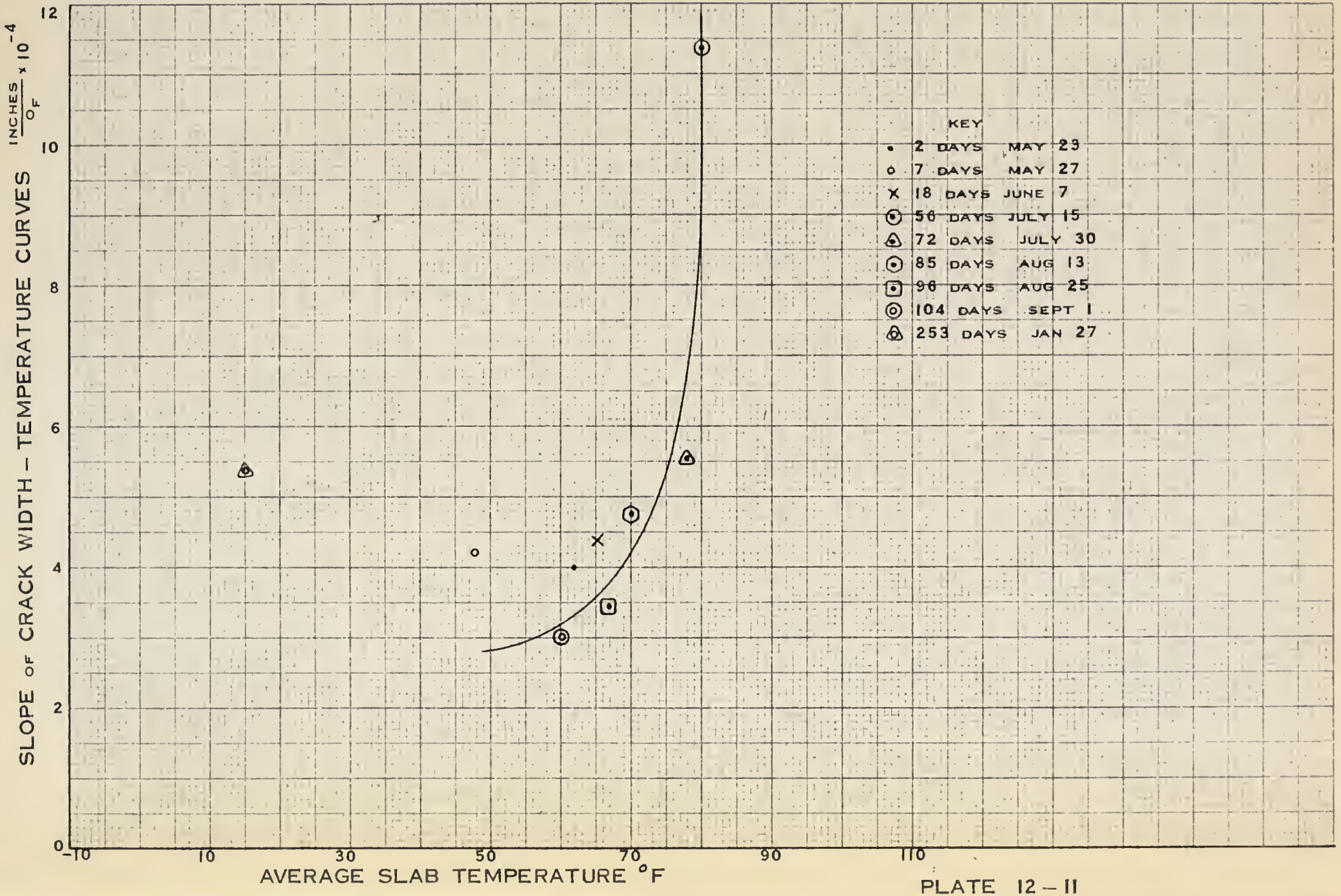


PLATE 12 – II

STEEL STRAIN – CRACK WIDTH CURVE

SECTION TYPE A – 8 LOCATION XII STATION 199+53

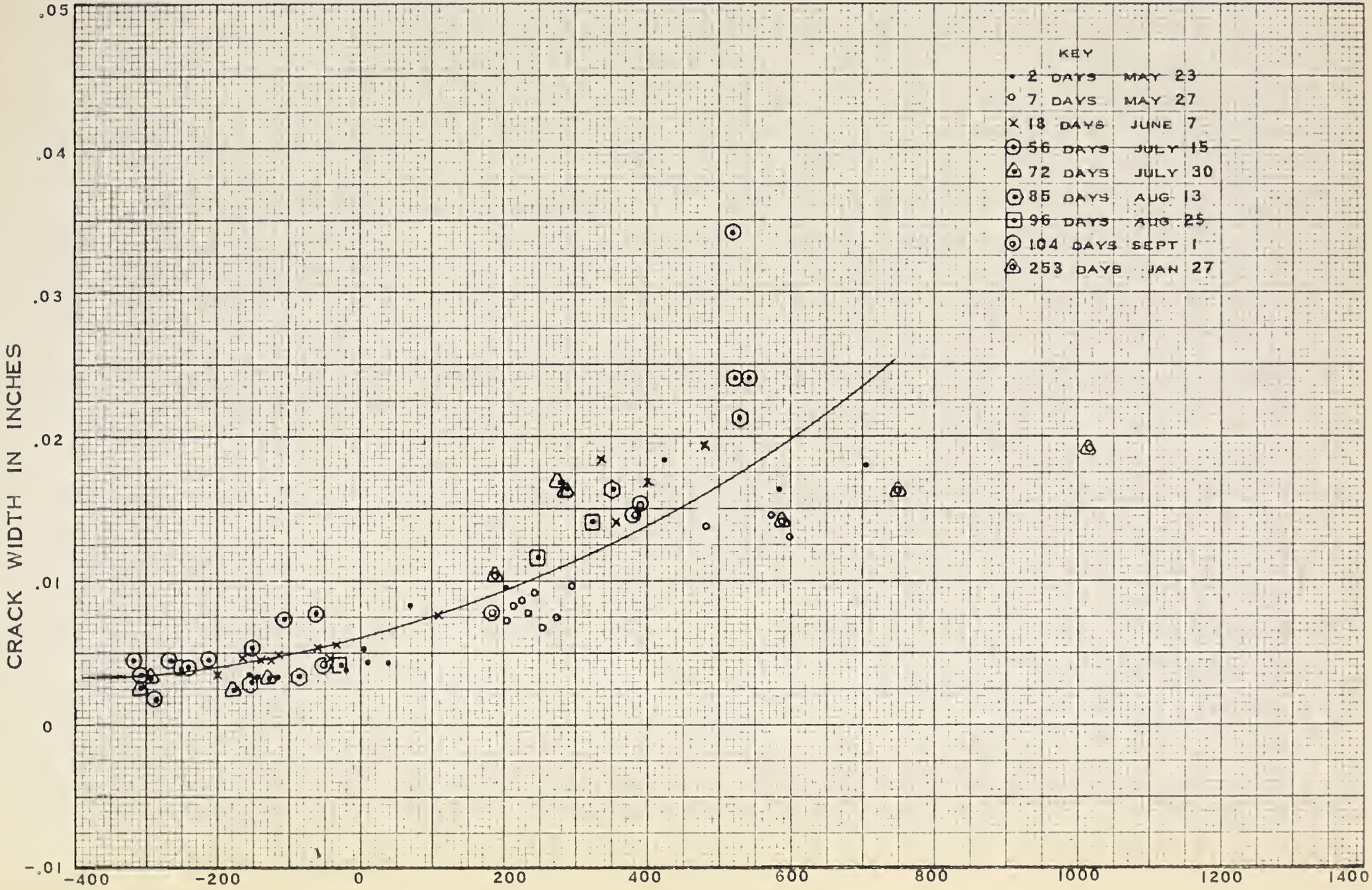


PLATE 12 – 12

SECTION TYPE A-8 LOCATION XII STATION 199+53

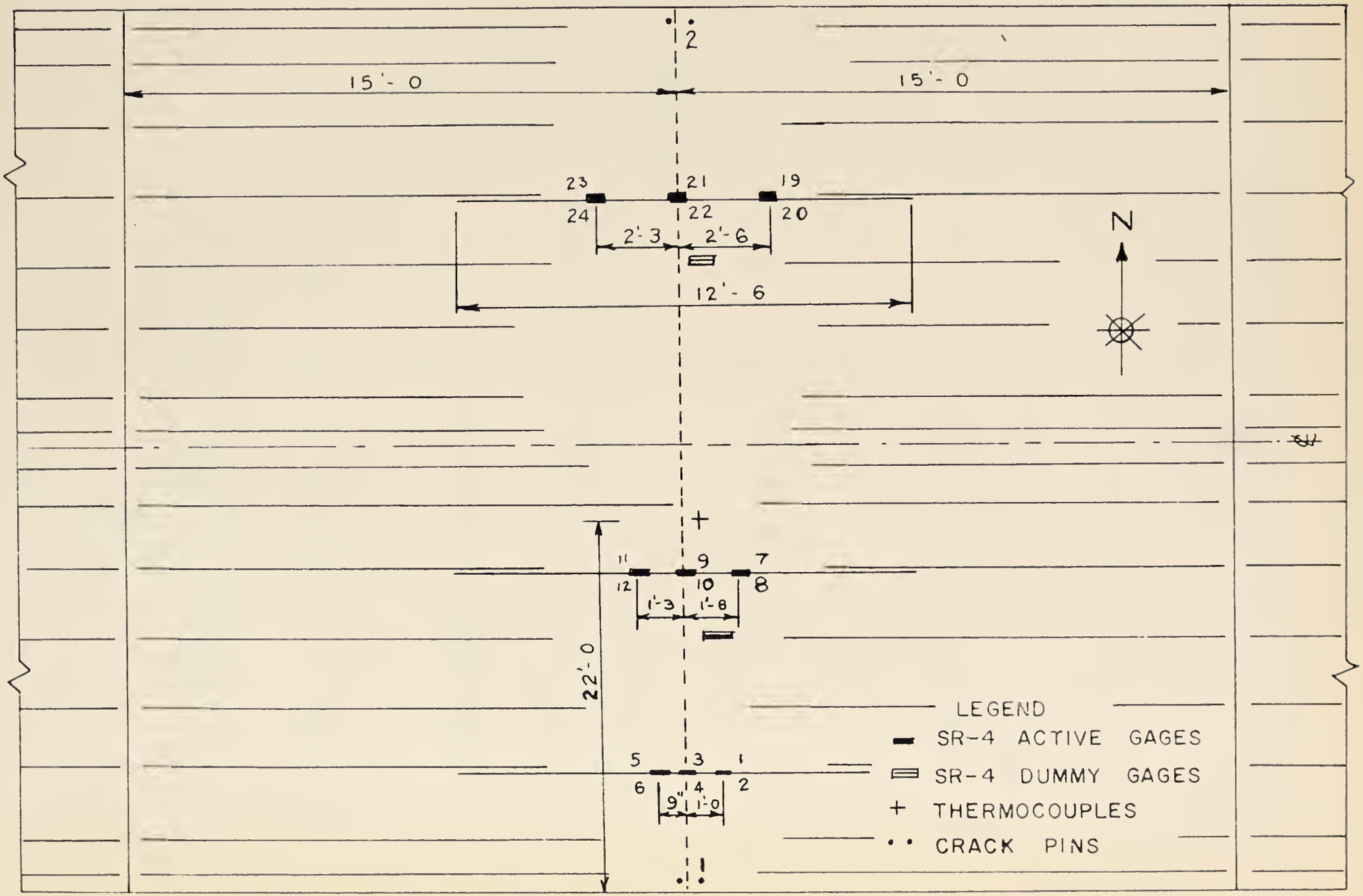


PLATE 12-13

VII. SUMMARY OF CONCLUSIONS

Location I

The reinforcing steel had strained beyond the yield point, and as a result, the absolute magnitude of the strains is not known. Relative magnitudes of strains are correct.

Straight line relationships exist between slab temperature, crack width and steel strain.

The crack did not close completely but rather, it reached a limiting value at 77°F. Higher slab temperatures resulted in the compression of concrete.

Plastic flow is evident and helps to relieve the strains at a crack.

Activated bond extended to about 16 bar diameters away from the crack.

Location II

The absolute magnitude of steel strains is unknown because the steel strained beyond the yield point. Relative magnitudes are dependable.

Straight line relationships exist between slab temperature, crack width and steel strain.

The crack rather than closing completely reached a limiting value at 74°F. Higher slab temperatures resulted in compression of the concrete.

Strains at the crack were relieved by plastic flow.

Activated bond extended to about 27 bar diameters away from the crack.

Location III

Three of the 4 gaged bars had strained beyond the yield point. Bond loss was sufficient for the one remaining bar to prevent yielding. Due to yielding of the bars, the absolute magnitude of the strains is unreliable, but the relative magnitude of the strains is reliable.

The crack closed completely at a temperature of 70°F resulting in compression of the concrete with higher temperatures. The complete closure of the crack also affected the steel strain.

Straight line relationships exist between slab temperature, crack width and steel strain. A change in slope occurs when the crack closes completely.

Activated bond extended to about 16 bar diameters away from the crack.

Location VI

The strains in the reinforcing steel appear to be below the yield point. The absolute magnitude of the strains is not certain because of the long time interval between winter and summer readings, but relative magnitudes of the strains are reliable.

Straight line relationships exist between slab temperature, steel strain and crack width.

The crack closed completely at a temperature of 69°F. Closure of the crack resulted in compression of the concrete. The effect of crack closure on steel strains is demonstrated by the change in slope at approximately the same temperature.

Activated bond extended for a distance of 24 bar diameters away from the crack.

Horizontal bending is the most pronounced seasonal effect. To take care of horizontal bending, more reinforcing steel is required in the inside lane of a horizontal curve.

Location IX

The reinforcing steel did not strain beyond the yield point. One bar in the north lane indicates yielding when readings were taken during January 1960. "SR-4" gages in the north lane appear to be very erratic. Therefore only the gages in the south lane are analysed.

Straight line relationships exist between slab temperatures, steel strains and crack widths.

The crack closed completely at 69°F. With the cold weather in the winter, an adjacent crack opened and relieved the crack opening at the preformed crack.

Plastic flow is slightly evident.

Activated bond extended for a distance about 24 bar diameters away from the crack.

Location X

The steel did not strain beyond the yield point at the preformed crack. Steel strains appear to be very erratic indicating either a peculiar pavement behavior or instability of the "SR-4" gages.

A change in length of the slab is accounted for by the movement of the slab over the pavement. Very little strain is induced into the bonded concrete and steel.

Seasonal behavior is very predominant in the slab. Maximum strain in the steel and widest crack opening were measured at the

same time as the greatest single daily temperature variation occurred.

Activated bond extended to a distance of 30 bar diameters away from a crack.

Location XI

The maximum steel strain recorded was nearly one half of the yield point strain. The maximum steel strain recorded in January was only about 200 micro inches per inch in excess of the strain recorded in July. Compressive strains were small compared to the tensile strains.

The crack did not close completely. The maximum crack width of 0.023 inches was measured in July.

The steel strain and the crack width are straight line functions of the temperature. The susceptibility of the strain and crack width varied with the average slab temperature for any particular period.

Seasonal variation in the behavior of the pavement is very noticeable. Plastic flow is noticeable also, but, to a much lesser degree.

Activated bond extended to a distance about 30 bar diameters away from the crack.

Indications are that the hottest part of the year was the most critical time in the life of the pavement.

Location XII

The maximum steel strain recorded in January was slightly more than one half of the yield point strain. The maximum daily range in the steel strain occured when the average slab temperature

was at its highest value. Compressive strains were small compared to the tensile strains.

The crack closed to a limiting value throughout the entire summer. The maximum crack width of 0.03 inches was measured in July.

Steel strain and crack width are straight line functions of the temperature. Susceptibility varies with the average slab temperature for any particular period.

Seasonal behavior of the pavement is very noticeable. Plastic flow is evident to a much lesser extent.

Activated bond extended to a distance of 36 bar diameters away from the crack.

The hottest part of the year appears to be the most critical time in the life of the pavement.

VIII. COMPARISON OF CONTINUOUSLY REINFORCED PAVEMENT SECTIONS

The same general behavior is evident for all sections of the continuous pavement. This can be illustrated by an examination of the measurements obtained for each pavement type.

The steel strain at a crack is a straight line function of the centre slab temperature. The crack width is a straight line function of the top slab temperature. This particular correlation for the crack width indicates that surface crack widths rather than average crack widths are being measured. Another straight line relationship exists between the crack width and the steel strain at a crack. The preceding statements point out the fact that a continuous pavement behaves according to the free body diagram proposed by Friberg.(2) Further proof of this statement comes from the fact that the magnitude of the strains is least in summer and greatest in winter.

For all sections, the strain in the steel, at points away from the crack, followed the same pattern. The range of daily variation in the strain corresponded to the range of daily variation in the average slab temperature. This indicates that the strain in the steel at points away from the crack is a measure of the strain in the bonded concrete and steel at the same point.

Further similarity is evident when the magnitude of the strain in the steel, at points away from the crack, is considered. The magnitude of the strains decreased with an increase in the average slab temperature. Following the period of peak slab temperatures in July, the average slab temperature began to decrease. An increase in the magnitude of the strain in the steel is noted. This phenomenon may be attributed to plastic flow of the concrete under sustained

stress.

From the crack width versus temperature curves, it can be seen that each crack either closed completely or closed to a limiting value. The temperature at closure is highest for Location I, which was poured first, and lowest for Location IX, which was poured last. The temperature at closure is considerably higher than the pouring temperature of the concrete.

Evidences of seasonal pavement behavior are found in all pavement types. Plotted points scatter within a narrow band on each side of the plotted curve for the graphs of steel strain versus temperature, crack width versus temperature and crack width versus steel strain.

Differences among the various pavements are noticeable when particular plots are compared. The slopes of the strain versus temperature curves, crack width versus temperature curves and crack width versus steel strain curves are different for different pavement types. The magnitude of the maximum steel strain and the maximum crack opening varies from location to location.

The difference in slope of particular curves suggested the possibility of being able to determine the percentage of steel required in a continuously reinforced concrete pavement. The slopes of various curves were plotted as a function of the percentage of steel. No correlation appeared to exist. Next the logarithms of the slopes were plotted versus the percentage of steel but still no correlation was found. Finally, the effect of the nearest crack was considered. The slopes of the curves were plotted as a function of the percentage of steel divided by the distance to the nearest

crack. Still no correlation could be found. The determination of the percentage of steel required in continuous concrete pavements from the data available to date appears to be impossible.

One of the design criteria for continuous concrete pavements is that the total yield point strength of the steel equal the total tensile strength of the concrete. The tensile strength of the concrete is assumed to be 1/10 of the concrete compressive strength. The concrete used in this project varied in strength from 4000 psi to 5500 psi. A simple calculation will show that the total yield point strength of the steel was greatly exceeded by the total potential tensile strength of the concrete. This may be why the percentage of steel required cannot be determined.

Much consideration was given as to whether or not the preformed crack was a typical crack. The effect of the preformed crack on the cracking pattern may be seen from the Plates showing the crack spacing in August 1959. The effect is not the same at all locations. Judging from the crack spacing, the preformed crack is a typical crack at some locations and the worst possible crack at other locations. The final cracking pattern has not been fully attained because the pavement is still cracking.

Since the B6-1 type pavement is the only continuous section placed at a horizontal curve, this is the only place where horizontal bending occurred. Bending in a horizontal plane requires more reinforcing in the intrados lane of a curve to prevent the overstressing of the steel in the intrados lane.

IX. COMPARISON OF CONVENTIONALLY REINFORCED PAVEMENT SECTIONS

The conventionally reinforced concrete sections appear to behave according to the criteria proposed by the Portland Cement Association.[3] The 30 foot slabs slide over the supporting subgrade whenever a length change occurs with some straining occuring at the crack. The bonded concrete and steel strain very little since the strain in the steel at points away from the crack shows only slight variation with changes in temperature.

All three sections show similarity in behavior. The maximum steel strains recorded at a crack are well below the yield point. Similarly, the maximum crack opening measured was small and occured in the hottest part of the year. The maximum steel strain did not occur at this time but the greatest range in daily variation in the steel strain did. Since the steel strain and crack opening are the result of subgrade friction, maximum strain and crack opening can occur when movement is greatest. Maximum movement occurs at the same time as the largest change in the slab temperature. Therefore, summer may be the most critical time of the year for a conventionally reinforced concrete pavement.

The steel strain at a crack is a function of the centre slab temperature while the crack width is a function of the top slab temperature. The cracks did not close completely during the summer.

Differences in behavior of the three pavement types are evident when the maximum magnitudes of steel strains and crack widths are considered. Maximum crack opening and maximum steel strain occured in the A-6 type pavement, while the smallest magnitudes occured in the A-7 type pavement. Although type A-6 has the largest steel per-

centage, it appears to be performing least satisfactorily.

The A-6 type pavement was constructed in the fall of 1958 when average slab temperatures were decreasing while the A-7 and A-8 type pavements were constructed in the spring of 1959 when average slab temperatures were increasing. The time of construction appears to have a very important effect on the behavior of the pavement sections. The different type of seasonal behavior, for spring and fall construction, is evident when the strain temperature curves and the crack width temperature curves are compared for the three types of pavement. The susceptibility of the spring constructed slabs changes with changing average slab temperature while the susceptibility of the fall constructed slabs remains constant. Fall construction appears to have a more severe effect than does spring construction.

Maximum crack opening and maximum steel strains were greater in the A-8 type pavement than in the A-7 type but were small. The A-8 pavement appears to be performing satisfactorily. Perhaps, even smaller percentages of steel could be used.

Plastic flow is evident in both A-7 and A-8 pavement sections. It is obscured by erratic strains in the A-6 type pavement.

X. COMPARISON OF CONVENTIONAL AND CONTINUOUS PAVEMENTS

Conventional and continuous concrete pavements provide a striking contrast in their behavior. Perhaps the most significant difference is the method by which both pavement types account for length changes.

A conventional pavement of the type investigated herein slides over the supporting subgrade whenever length change occurs. Only a very small portion of the length change is introduced as strain in the steel reinforcing at a crack. The strain in the bonded concrete and steel is practically insignificant as can be seen by the strain in the steel at points away from a crack. On the other hand, the interior portions of continuous pavements cannot move. Length changes must be accounted for on the basis of straining of the steel at a crack and straining of the bonded concrete and steel away from the crack. The daily variation in steel strain at points away from a crack is much greater for the continuous sections than for the conventional sections.

As a result of the two different methods for relieving length changes, maximum steel strains and crack widths for both pavement types occur at different times of the year. Maximum strains and crack openings for conventional pavements will be measured during the hottest part of the year since this is the time when greatest temperature changes occur, thus creating the largest length changes. Steel strains in the continuous sections will be at a minimum during this period. Maximum steel strains and crack openings for the continuous sections will occur during the coldest part of the year when the

temperature is at its lowest value. Steel strains and crack openings for conventional sections may or may not exceed the values recorded in the summer.

The magnitude of the steel strains recorded in the continuous pavement is far greater than that recorded in the conventional pavement. Crack openings are also wider.

From reasoning and experimentation, it may be concluded that summer is the most critical time of the year for conventional pavements whereas winter is the most critical time of the year for continuous pavements.

XI. RECOMMENDATIONS

The method described in a previous thesis[1] for the application and waterproofing of "SR-4" gages, has proved to be very satisfactory. This method is recommended for future work.

Lead wires were placed in a watertight electrical conduit at Locations XI and XII. This gave excellent gage stability and reduced the capacitance of the leads. A further increase in indicator response may be obtained by connecting a capacitor across the dummy gage.

For better accuracy, two thermocouples placed in series is recommended.

Test cylinders and beams should be obtained at strain gage locations to determine the tensile strength of the concrete.

Following construction, readings should be taken every two or three hours for at least three days. After this period, readings may be taken at some regular interval of time.

Since there is seasonal behavior in the pavement, readings will be most reliable when taken every three hours during a 48 hour period for any location.

Indications are that sawing the concrete to provide a preformed crack, did not give a typical crack. Some other method for providing a preformed crack should be used in future work. A strip of heavy wax paper placed where the crack is wanted, will reduce the cross-sectional area of the slab at this point and act as a stress raiser causing a crack to form.

Much information on subgrade reaction, strain in the bonded

concrete and steel and the length of bond loss, can be obtained from laboratory tests of pavement slabs.

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4. Road Research Laboratory DSIR, "Concrete Roads Design and Construction."

5. M.D. Shelby and F.F. McCullough, "Experience in Texas with Continuously Reinforced Concrete Pavements" Unpublished Report, Texas Highway Department 1959.

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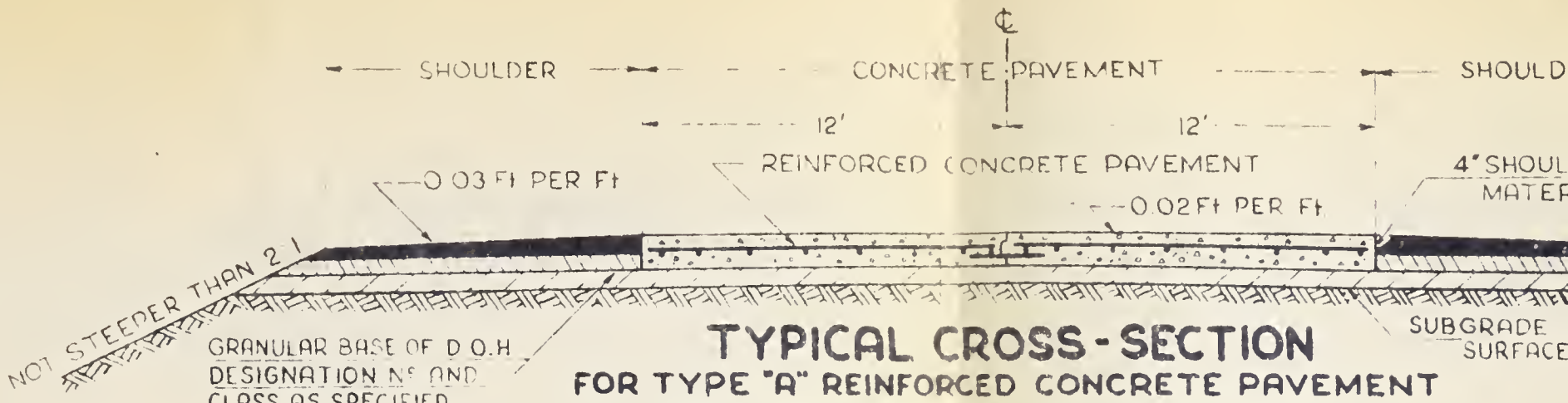
9. W.R. Woolley, "Continuously Reinforced Concrete Pavement Without Joints" HRB Proceedings Volume 27, 1947.

10. W.R. Woolley, "Design of Continuously Reinforced Concrete Pavements" HRB Bulletin 181.

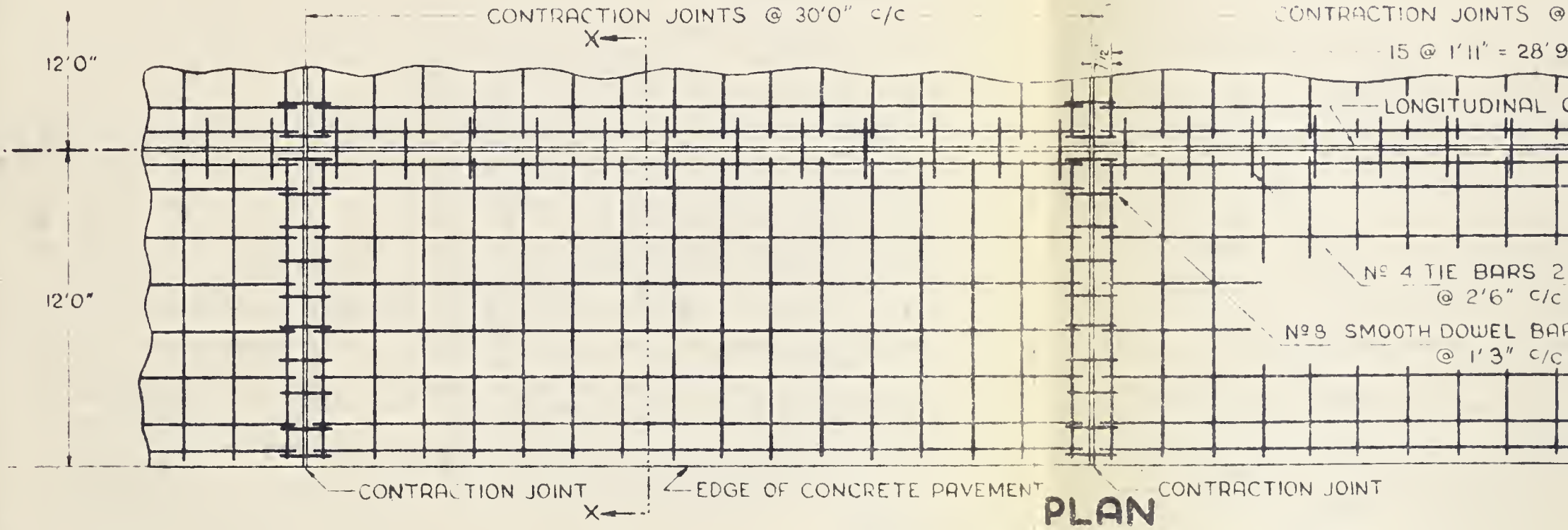
APPENDIX A

MISCELLANEOUS DIAGRAMS AND CURVES

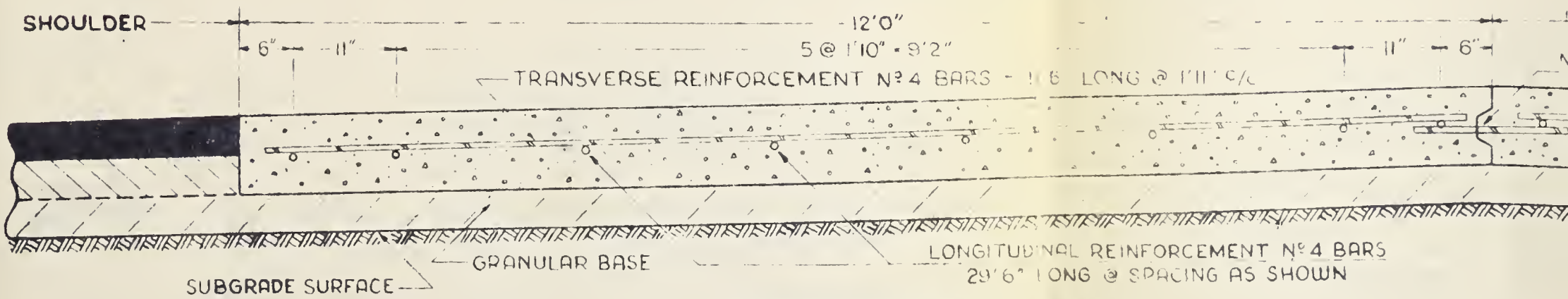
S 118-P



TYPICAL CROSS-SECTION
FOR TYPE "A" REINFORCED CONCRETE PAVEMENT WITH ASPHALTIC BOUND SHOULDERS

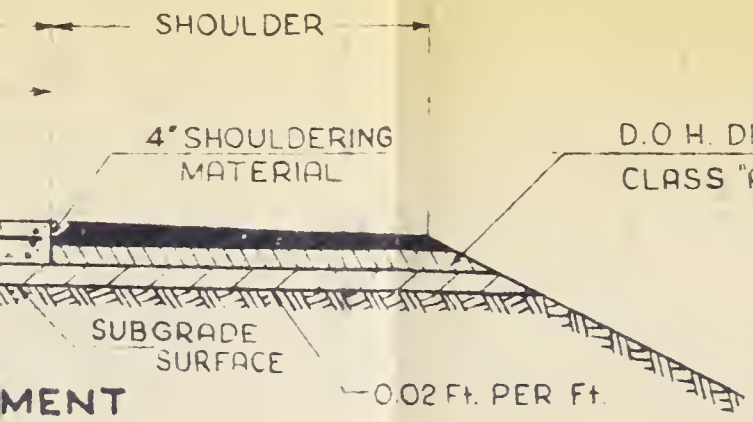


PLAN
TYPICAL REINFORCED SLAB TYPE "A"

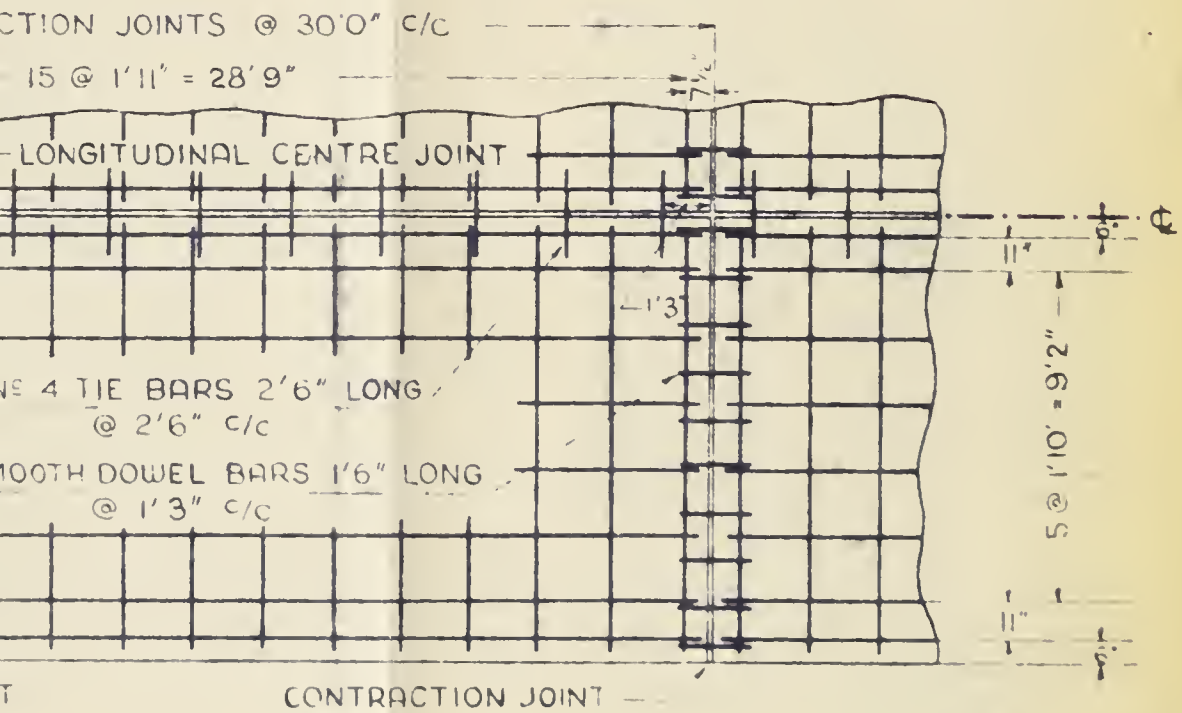


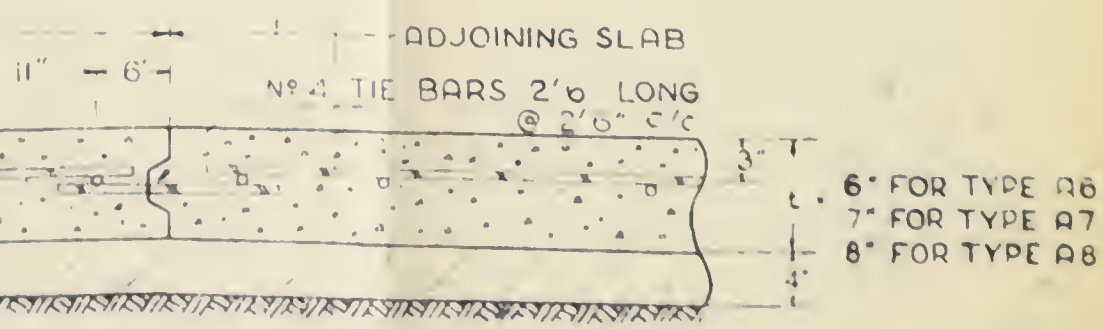
TRANSVERSE SECTION X - X

NOTE: LONGITUDINAL AND TRANSVERSE REINFORCING SHALL BE DEFORMED BARS OF HARD GRADE STEEL. DOWELS SHALL BE SMOOTH BARS OF HARD GRADE STEEL. TIE BARS SHALL BE DEFORMED BARS OF INTERMEDIATE OR STRUCTURAL GRADE STEEL.
FOR REINFORCED CONCRETE PAVEMENT TYPE A6 t = 6 INCHES, TYPE A7 t = 7 INCHES AND TYPE A8 t = 8 INCHES. SPACING AND SIZE OF LONGITUDINAL AND TRANSVERSE REINFORCING STEEL AS DETAILED SHALL BE THE SAME FOR TYPES A6, A7 AND A8 REINFORCED CONCRETE PAVEMENTS.



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FOR

PROVINCE OF ALBERTA - DEPARTMENT OF HIGHWAYS

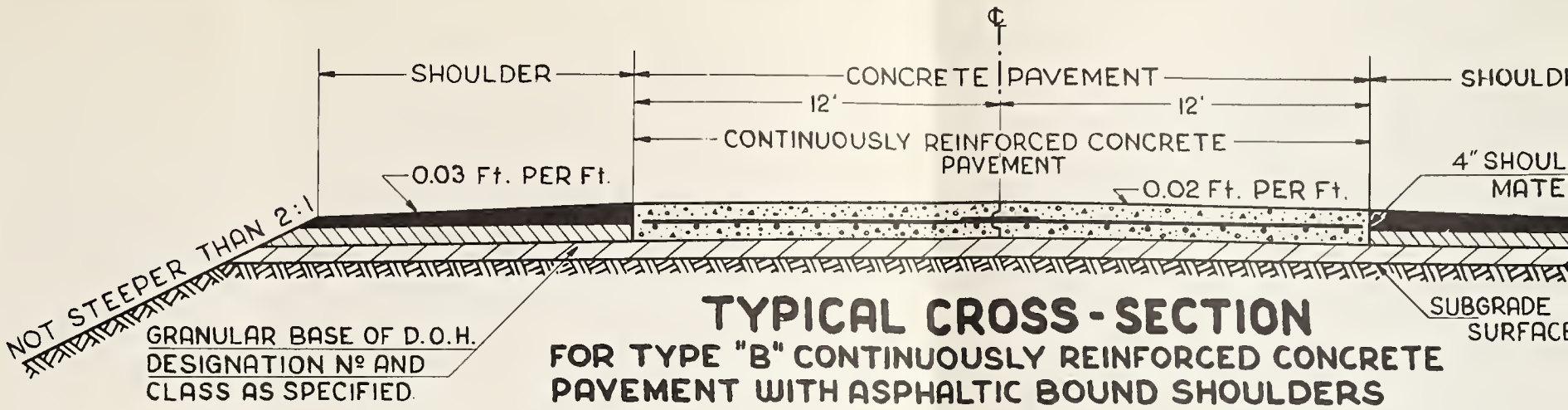
REINFORCED CONCRETE PAVEMENT TYPE "A"

2 LANES WITH ASPHALTIC BOUND SHOULDERS

APRIL 22, 1958

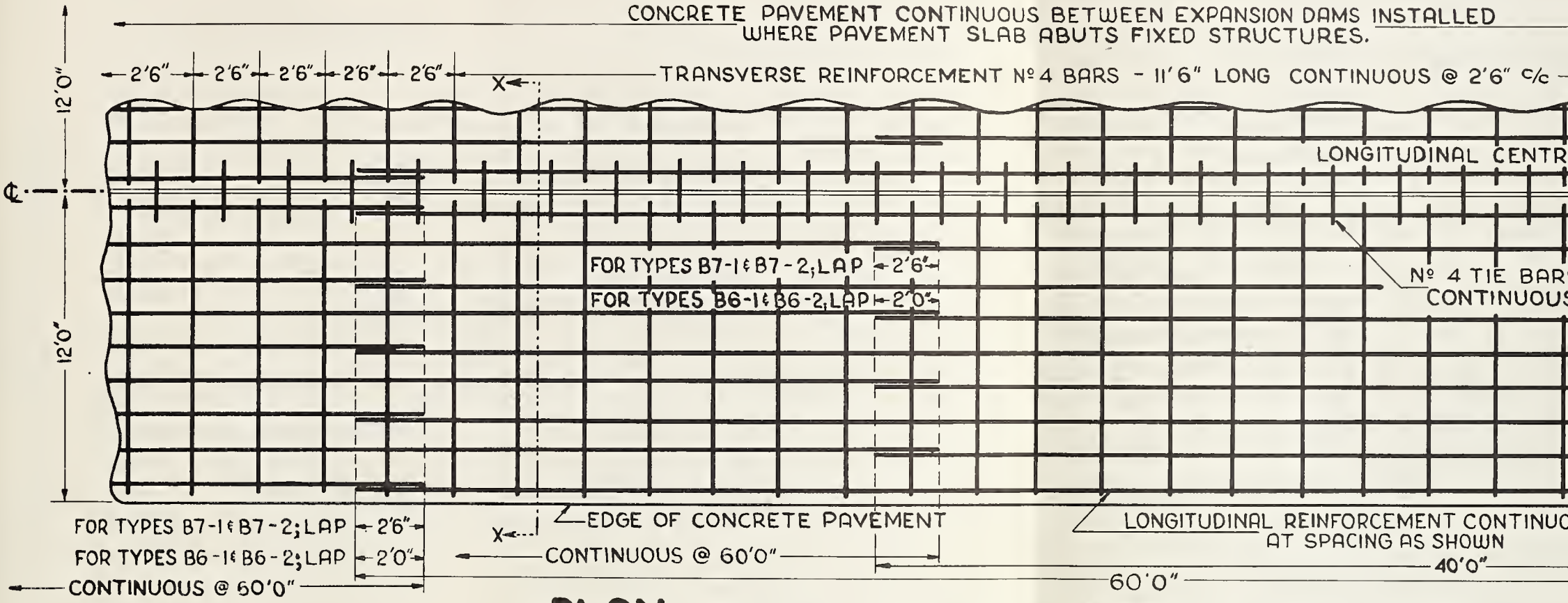
PLATE 1

S 118-Q

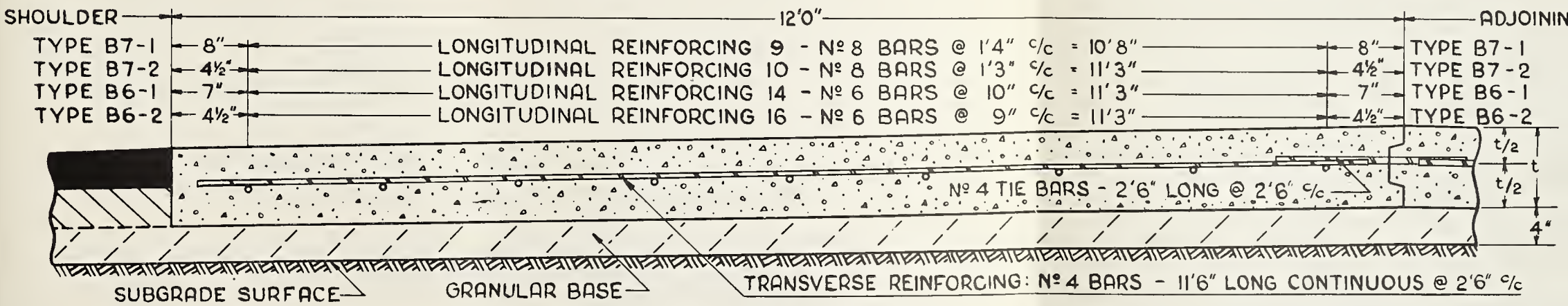


TYPICAL CROSS-SECTION

FOR TYPE "B" CONTINUOUSLY REINFORCED CONCRETE PAVEMENT WITH ASPHALTIC BOUND SHOULDERS



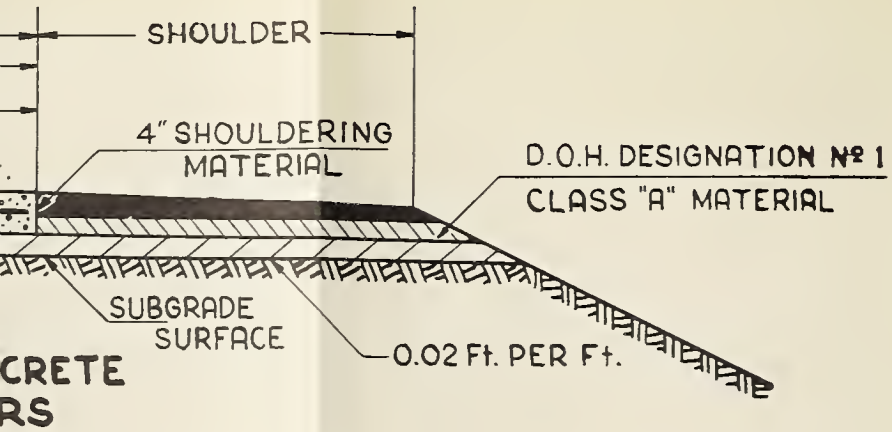
PLAN - TYPICAL CONTINUOUSLY REINFORCED SLAB TYPE "B"



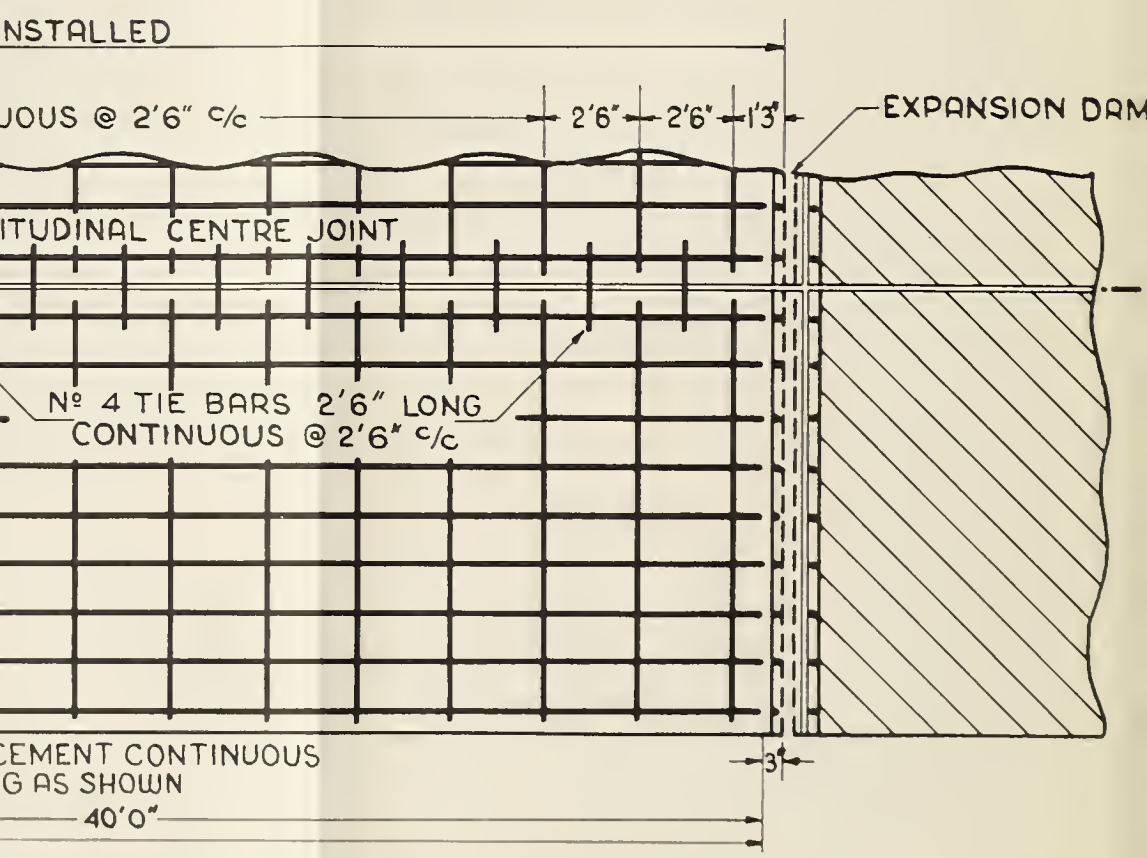
TRANSVERSE SECTION X - X

NOTE: LONGITUDINAL AND TRANSVERSE REINFORCING SHALL BE DEFORMED BARS OF HARD GRADE STEEL. TIE BARS SHALL BE DEFORMED BARS OF INTERMEDIATE OR STRUCTURAL GRADE STEEL.

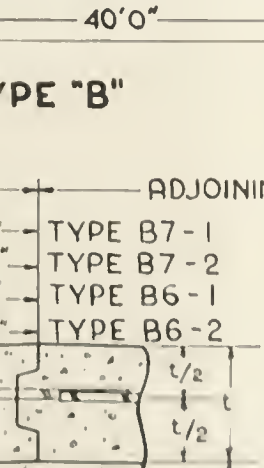
SPACING AND SIZE OF TRANSVERSE REINFORCING STEEL SHALL BE THE SAME FOR TYPES B7-1, B7-2, B6-1 AND B6-2 CONTINUOUSLY REINFORCED CONCRETE PAVEMENTS. SPACING AND SIZE OF LONGITUDINAL REINFORCING SHALL BE AS SHOWN ABOVE.



CRETE
RS



PE "B"



OUS @ 2'6" c/c

NOTE: FOR TYPES B7-1 & B7-2 CONTINUOUS
REINFORCED CONCRETE PAVEMENT: t
FOR TYPES B6-1 & B6-2 CONTINUOU
REINFORCED CONCRETE PAVEMENT: t

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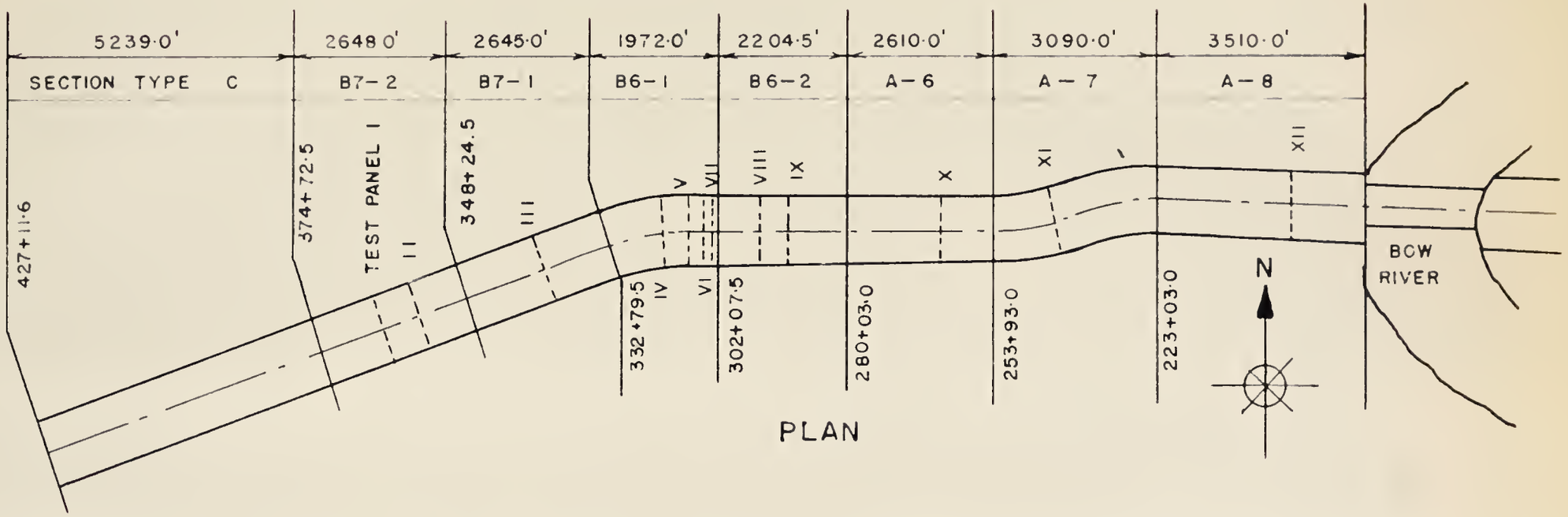
PROVINCE OF ALBERTA - DEPARTMENT OF HIGH

CONTINUOUSLY REINFORC
CONCRETE PAVEME
TYPE "B"
2 LANES WITH
ASPHALTIC BOUND SHOULDE

PLATE

APRIL 22, 1958

CONCRETE PAVEMENT
WEST OF CALGARY — WEST OF BOWNESS



PLAN

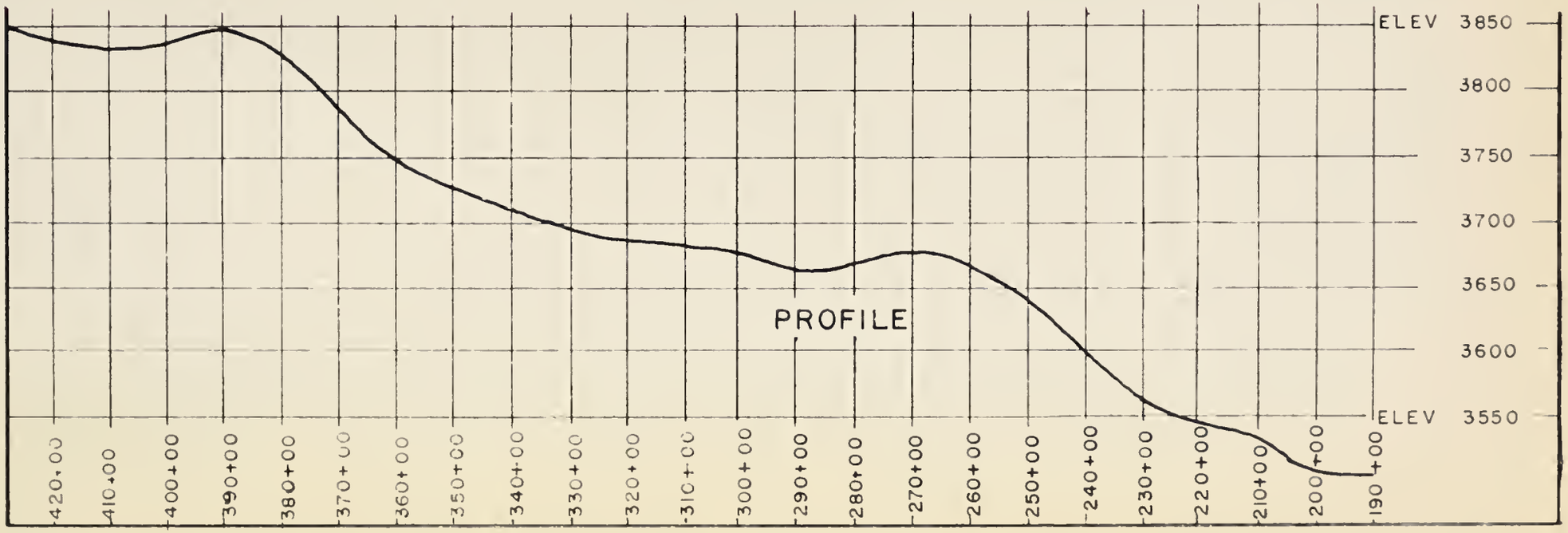


PLATE 3

LOAD – STRAIN CURVES OF STEEL REINFORCEMENT USED IN REINFORCED CONCRETE TEST ROAD

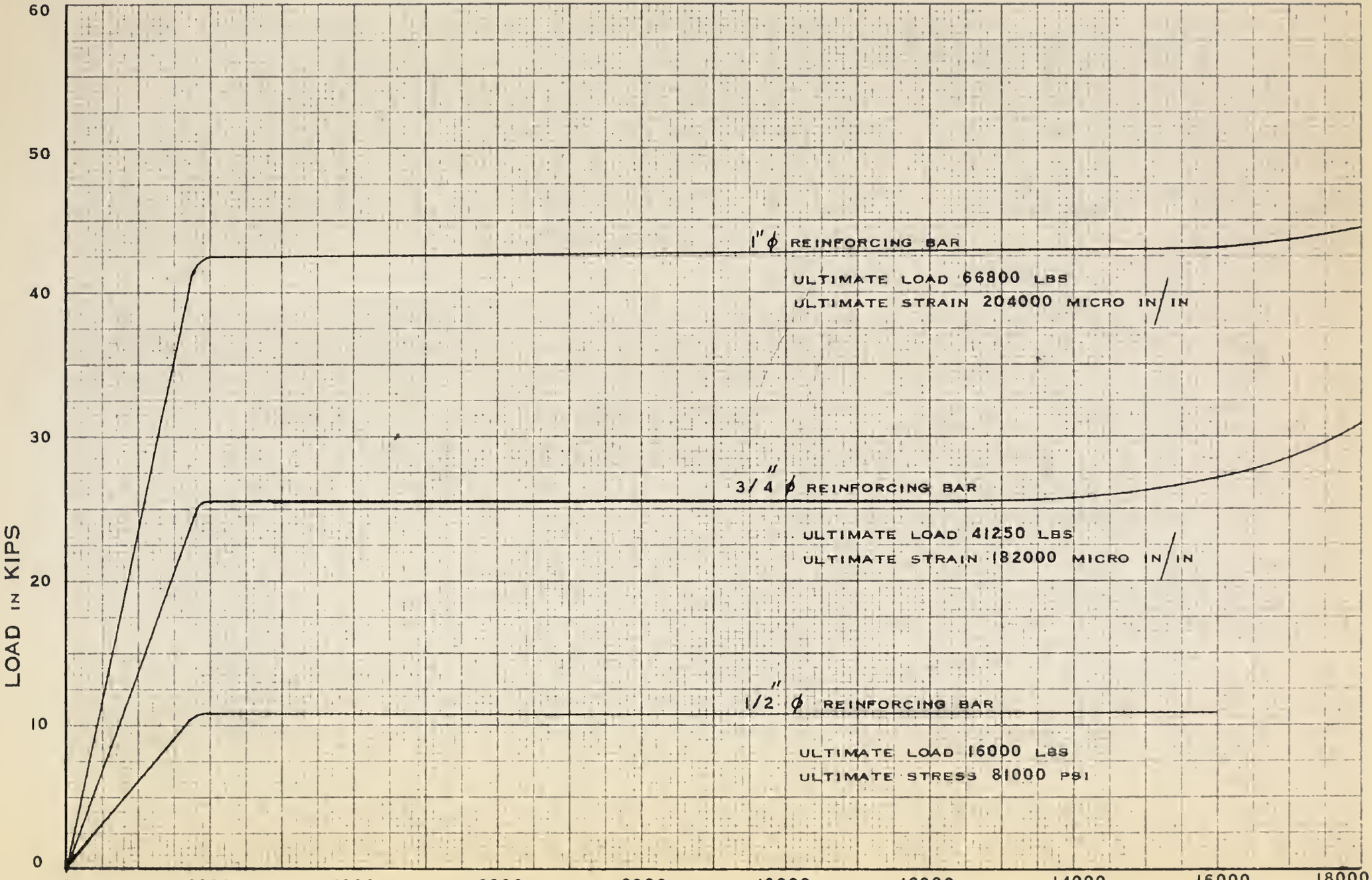
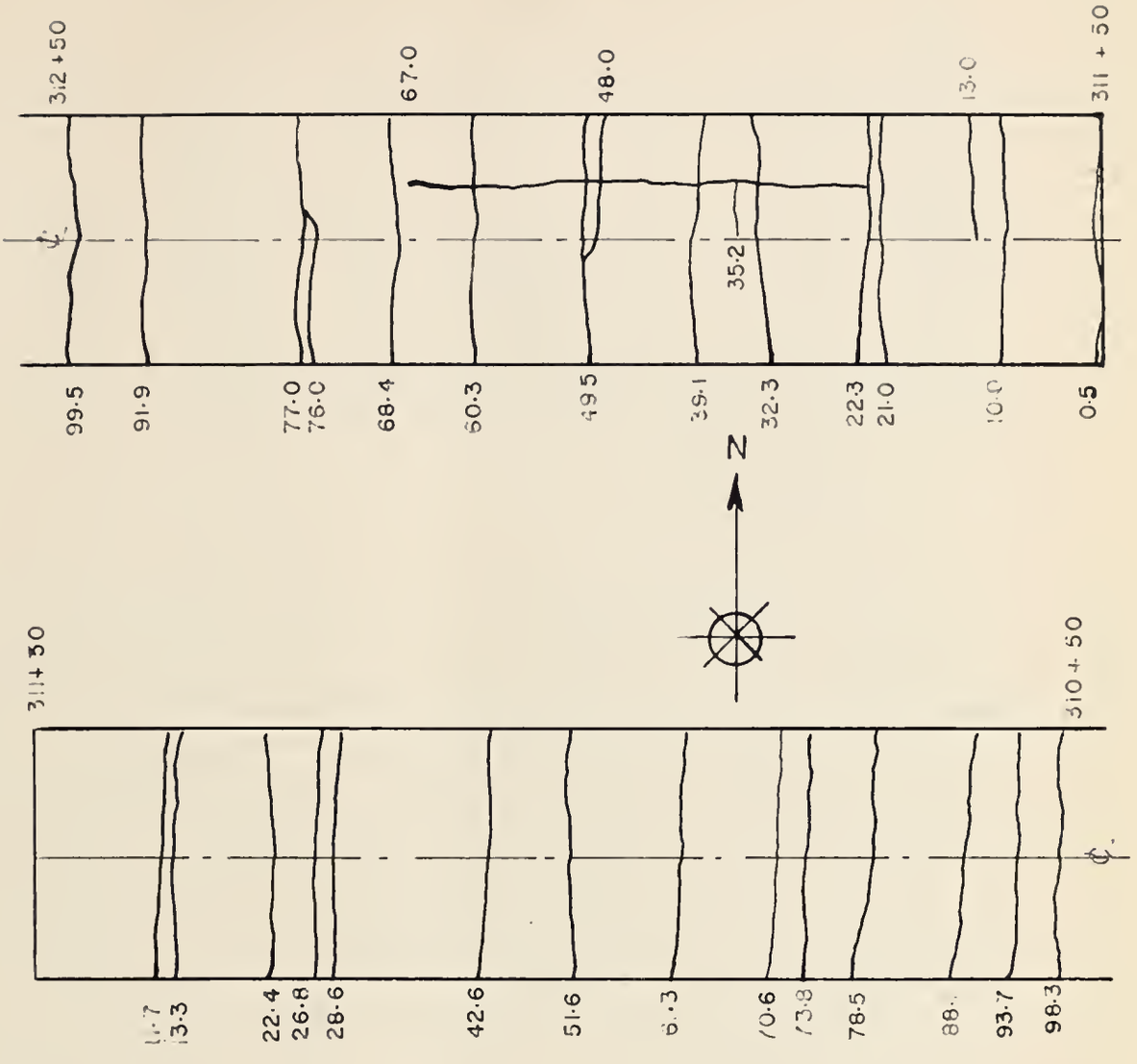


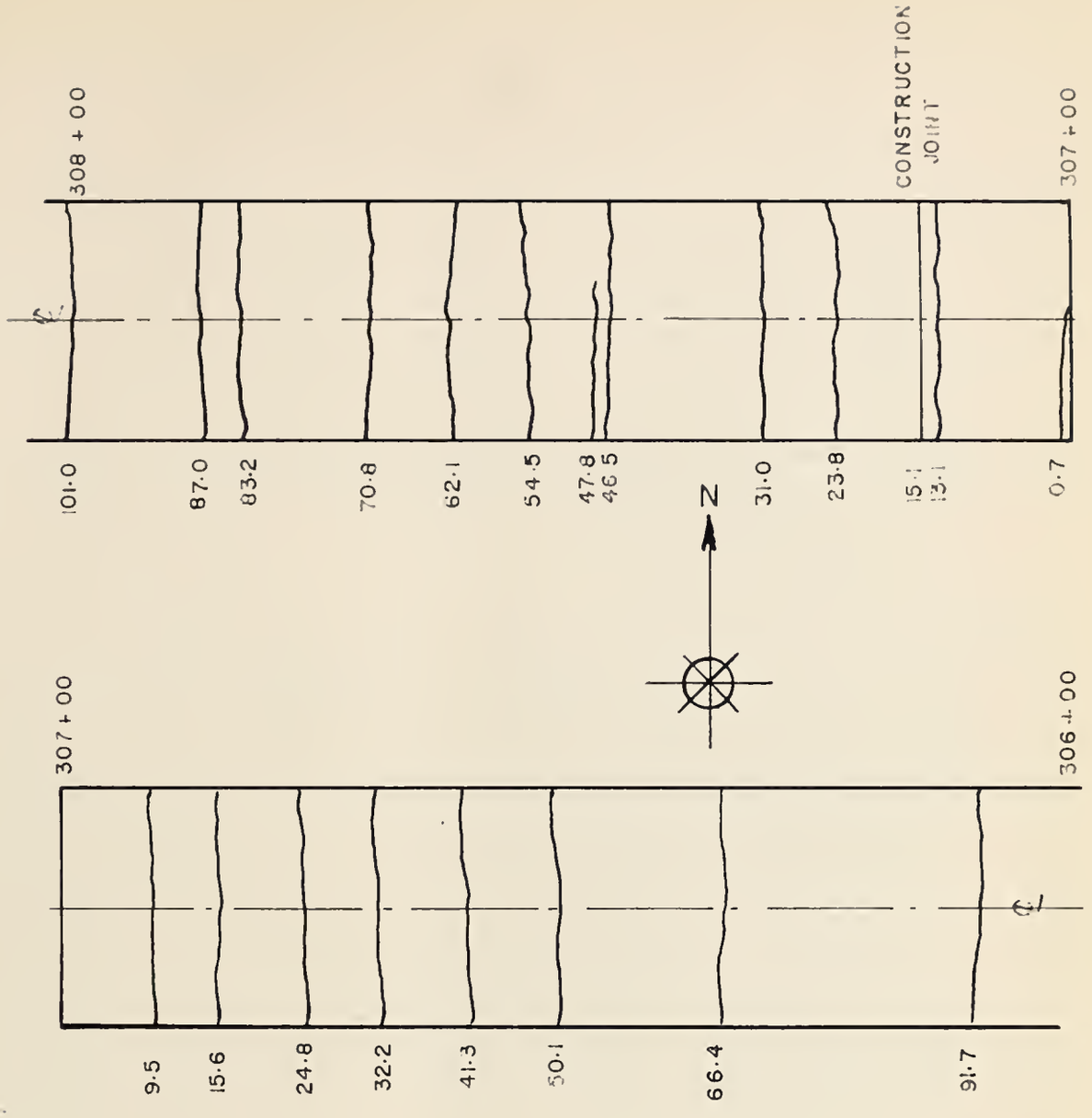
PLATE 4



SCALE 1" = 20'
LOCATION IV
STATION 311+50
TYPE B6 - 1

CRACK SPACING

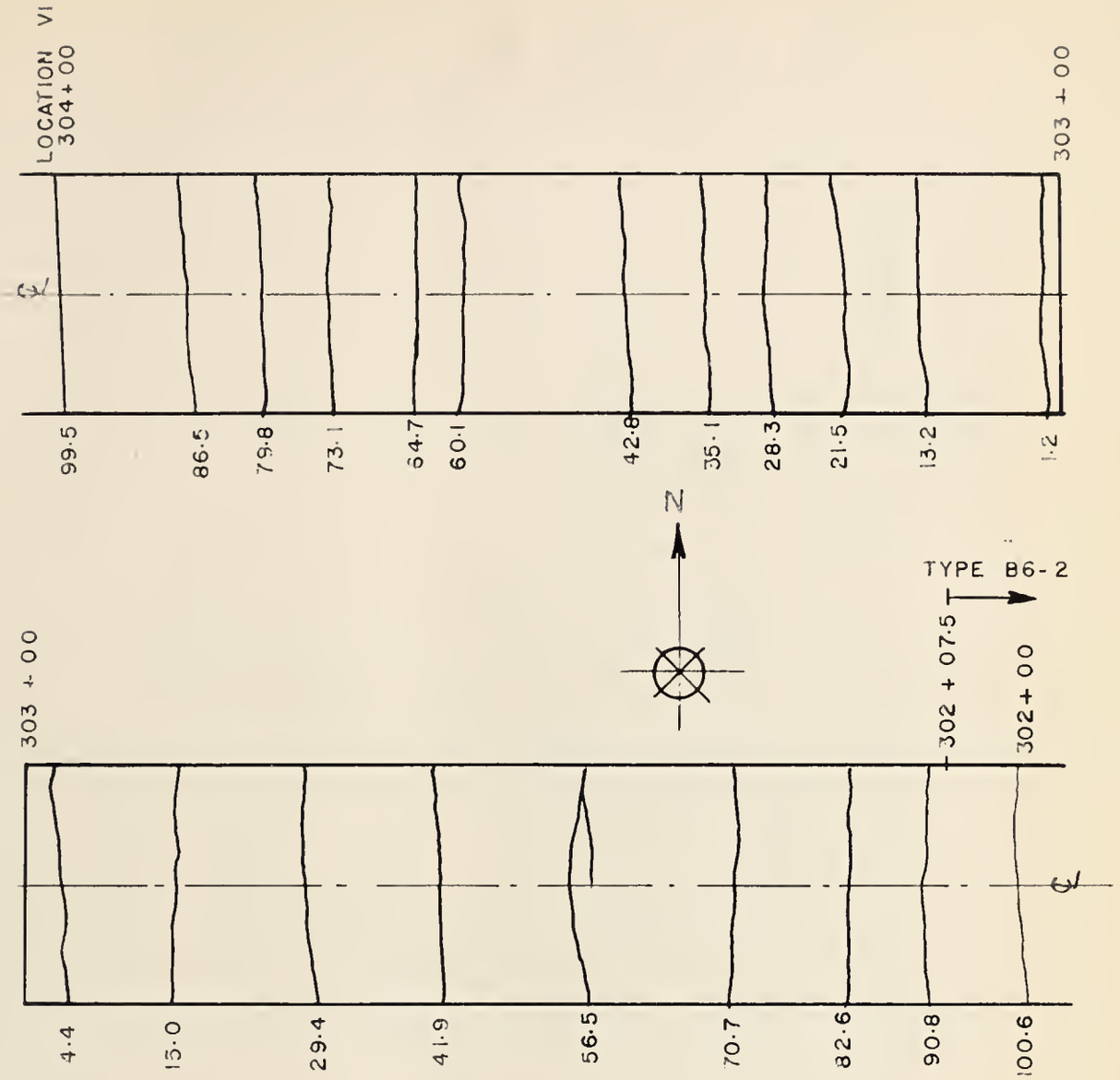
PLATE 5



SCALE 1" = 20'
LOCATION V
STATION 307 + 00
TYPE B6 – 1

CRACK SPACING

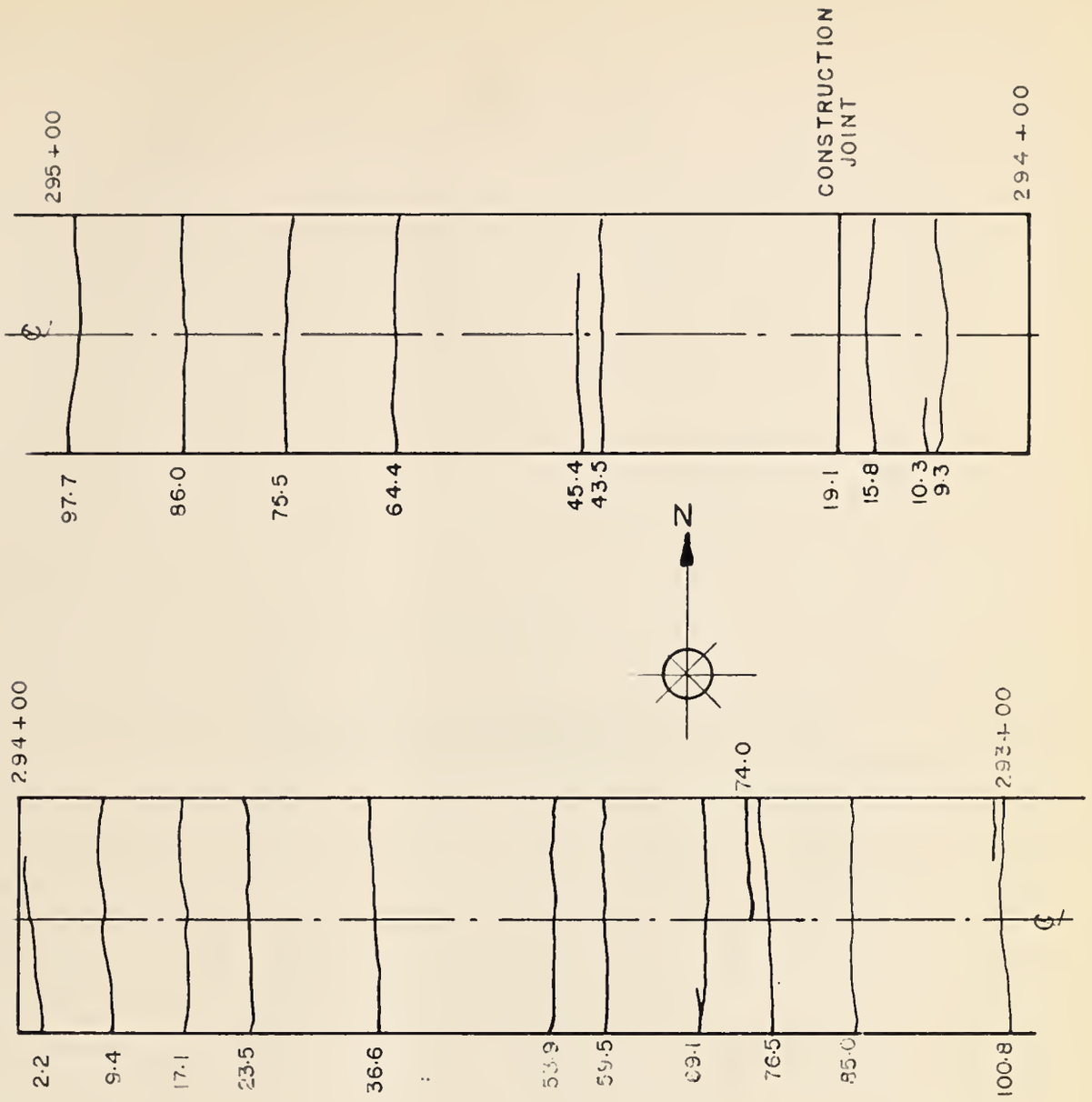
PLATE 6



SCALE 1" = 20'
LOCATION VII
STATION 303 + 00
TYPE B6 – 1

CRACK SPACING

PLATE 7



SCALE 1" = 20
LOCATION VIII
STATION 294+00
TYPE B6 - 2

CRACK SPACING
PLATE 8

APPENDIX B

COPY OF ORIGINAL DATA

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	July 13 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	263.03	263.28	263.70	264.26	265.17	283.20	283.42
AIR TEMPERATURE	63 F	68 F	47 F	64 F	66 F	72 F	70 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	285	235	315	195	185	85	45
2	325	275	360	225	220	120	85
3	4090	4030	4325	3980	3965	3905	3860
4	2105	1995	2350	1950	1950	1950	1910
5	395	230	330	180	175	60	25
6	330	270	370	230	225	120	90
7	385	330	410	285	280	185	160
8	345	290	375	255	245	145	115
9	---	---	---	---	---	---	---
10	4665	4595	4975	4555	4535	4445	4385
11	565	495	395	255	245	155	130
12	310	245	340	205	195	105	80
13	275	265	325	220	210	155	120
14	290	270	340	235	220	160	120
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	290	280	350	240	230	180	150
18	335	315	385	265	255	200	165
19	325	290	390	240	230	200	190
20	280	235	345	185	170	105	75
21	6790	6730	7015	6690	6670	6645	6630
22	7405	7345	7605	7295	7270	7225	7205
23	310	290	360	250	240	200	180
24	340	315	385	270	255	215	185

INSTRUMENTATION DATA

TEST ROAD - BOWNESS, ALBERTA

Section Type B7-2

Location I

Station 394+00

DATE OF READING	June 22 1959	June 23 1959	June 23 1959	June 24 1959	June 25 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	263.03	263.28	263.70	264.35	265.17	283.20
AIR TEMPERATURE	63 F	66 F	47 F	54 F	66 F	72 F

52-4 STRAIN GAUGE (MICRO IN./IN.)

Gage No							
1	285	235	315	195	185	65	45
2	325	275	360	225	220	120	85
3	4090	4030	4585	3980	3965	3905	3580
4	2105	1995	2350	1950	1950	1950	1910
5	395	290	330	180	175	60	25
6	330	270	370	230	285	120	90
7	365	330	410	285	260	165	160
8	345	290	375	255	245	145	115
9	---	---	---	---	---	---	---
10	4665	4595	4975	4535	4435	4445	4385
11	505	495	395	585	515	175	130
12	310	245	340	205	195	105	80
13	275	265	325	220	210	155	120
14	290	270	340	235	220	160	120
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	290	260	340	240	230	130	150
18	335	315	385	265	255	200	165
19	325	290	340	240	230	200	190
20	280	235	285	185	170	105	75
21	6790	6730	7015	6590	6670	6645	6630
22	7405	7345	7605	7295	7270	7225	7205
23	320	290	340	250	240	240	180
24	340	315	395	270	255	215	165

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	July 14 1959	July 14 1959	July 14 1959	July 14 1959	July 15 1959	July 30 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	283.75	284.14	284.24	284.40	284.74	299.77	300.03
AIR TEMPERATURE	46 F	73 F	81 F	75 F	55 F	48 F	66 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	195	110	45	15	165	265	240
2	245	140	70	50	225	310	280
3	4180	3935	3845	3815	4160	4335	4180
4	2260	1990	1925	1890	2225	2510	2300
5	195	85	15	- 5	175	295	255
6	240	145	80	60	220	330	290
7	300	215	150	125	285	380	350
8	265	180	115	95	245	335	305
9	---	---	---	---	---	---	---
10	4705	4495	4415	4360	4655	5025	4765
11	275	180	115	95	255	365	335
12	220	130	70	50	205	320	270
13	255	175	125	95	245	325	295
14	250	180	135	100	240	320	290
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	280	200	150	130	270	350	310
18	305	215	170	145	295	375	330
19	310	220	180	170	300	420	350
20	235	135	75	55	225	325	265
21	6795	6660	6625	6610	6760	6940	6750
22	7370	7245	7210	7185	7325	7525	7355
23	290	220	180	160	285	360	325
24	310	235	185	165	295	385	345

INSTRUMENTATION DATA

TEST ROAD — BOWMANS, ALBERTA

Section Type: TC-2

Location: 1 Station: [illegible]

Reading	July 12 1959	July 13 1959	July 14 1959	July 14 1959	July 14 1959	July 15 1959	July 20 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	259.75	260.14	260.24	260.42	260.74	265.77	270.02	
AIR TEMPERATURE	46 F	72 F	72 F	78 F	55 F	48 F	64 F	
[illegible]								
Gage No.								
1	295	120	45	25	165	205	210	
2	245	140	70	20	255	220	260	
3	4250	2925	3945	3615	4250	4235	4215	
4	2260	1970	1925	1870	2285	2321	2352	
5	195	85	15	5	175	205	235	
6	240	145	60	60	220	230	290	
7	300	215	150	125	285	300	350	
8	265	180	115	95	245	225	305	
9	---	---	---	---	---	---	---	
10	4705	4495	4415	4360	4485	4065	4165	
11	275	180	115	95	225	265	235	
12	220	130	70	50	205	220	270	
13	255	175	125	95	215	225	295	
14	250	180	125	100	240	230	290	
15	---	---	---	---	---	---	---	
16	---	---	---	---	---	---	---	
17	260	200	150	130	270	250	310	
18	305	225	170	145	305	275	320	
19	320	220	140	170	300	420	350	
20	240	135	75	55	205	225	205	
21	6705	6060	6525	6310	6760	6910	6750	
22	7270	7245	7150	7185	7225	7265	7255	
23	290	200	180	200	265	260	225	
24	270	205	145	145	205	225	245	

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7–2

Location I **Station** 364+00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	July 31 1959	Aug 13 1959	Aug 14 1959
AGE OF PAVEMENT IN DAYS	300.25	300.43	300.80	300.97	301.24	314.25	314.79
AIR TEMPERATURE	75 F	70 F	50 F	56 F	82 F	72 F	48 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	105	100	245	250	115	245	335
2	130	135	290	290	145	285	390
3	3985	3995	4335	4250	4015	4275	4325
4	2125	2125	2520	2370	2150	2420	2760
5	90	95	265	275	105	260	410
6	150	150	310	310	160	300	430
7	225	235	360	360	240	350	450
8	180	185	325	315	195	310	410
9	---	---	---	---	---	---	---
10	4620	4575	5025	4775	4615	4825	5325
11	200	215	360	355	225	330	475
12	140	140	300	290	160	270	410
13	190	175	310	305	195	295	395
14	190	170	300	295	190	300	390
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	205	190	335	330	210	305	430
18	215	215	360	345	235	325	455
19	260	280	410	380	290	350	490
20	145	155	305	285	170	265	415
21	6670	6665	6930	6790	6690	6770	7210
22	7255	7250	7505	7380	7295	7365	7795
23	240	240	360	345	255	325	450
24	145	245	375	365	265	345	475

INSTRUMENTATION DATA

TEST ROAD – EDMONTON, ALBERTA

Section Type: M7-1

Location: I

Section: 354-00

DATE OF OBSERVATION	July 30 1959	July 30 1959	July 31 1959	July 31 – Aug 1 1959	Aug 13 1959	Aug 14 1959
AIR TEMPERATURE	75 F	70 F	90 F	94 F	82 F	72 F	64 F
ASPHALT PAVEMENT IN LAST	300.25	700.43	300.80	700.27	700.25	334.25	334.7
Gage No.							
1	705	100	245	240	115	245	335
2	730	135	290	290	145	285	390
3	3985	3995	4325	4250	4015	4275	4325
4	2125	2125	2520	2370	2150	2420	2760
5	90	95	265	215	105	360	410
6	150	150	210	210	160	300	450
7	225	225	360	350	240	270	450
8	180	185	325	315	195	210	410
9	---	---	---	---	---	---	---
10	4620	4575	5025	4775	4015	4625	5225
11	200	225	360	325	205	330	475
12	140	140	300	290	160	270	410
13	190	175	310	305	195	295	395
14	130	170	300	295	190	300	390
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	205	190	335	330	210	305	430
18	215	215	365	345	235	325	455
19	260	280	410	380	290	350	490
20	145	155	305	285	170	265	405
21	6670	6565	6930	6790	6590	6770	7210
22	7255	7250	7500	7300	7295	7265	7745
23	240	240	360	345	245	325	450
24	145	245	375	365	205	345	475

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959	Aug 26 1959	Jan 26 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	315.25	325.23	325.81	326.27	326.82	480.27	480.96
AIR TEMPERATURE	72 F	59 F	41 F	66 F	50 F	11 F	9 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	185	265	370	235	345	460	555
2	220	310	420	270	390	525	625
3	4180	4335	4705	4300	4615	5170	5320
4	2345	2510	2800	2475	2800	2790	2940
5	185	285	495	240	385	1370	1520
6	230	325	510	285	420	1270	1410
7	295	380	490	345	460	770	870
8	255	345	455	300	415	725	815
9	---	---	---	---	---	---	---
10	4750	4885	5355	4835	5250	5515	5645
11	265	365	560	315	465	1210	1430
12	210	300	485	260	400	1055	1250
13	250	320	445	290	395	670	770
14	250	320	440	290	390	635	745
15	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---
17	260	325	480	290	410	805	970
18	275	350	515	315	445	875	1045
19	300	380	550	350	485	970	1135
20	205	300	475	270	410	875	1030
21	6710	6820	7325	6775	7130	8295	8360
22	7305	7425	7925	7375	7735	9200	9255
23	280	350	500	320	440	610	715
24	295	375	535	335	465	690	800

INSTRUMENTATION DATA

TED ROAD – ROWNESS, ALBERTA

Section Type B7-2

Location 1 Station 164+00

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	Jan 29 1960						
AGE OF PAVEMENT IN DAYS	483.18						
AIR TEMPERATURE	38 F						
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	530						
2	600						
3	4755						
4	2715						
5	1095						
6	1060						
7	795						
8	745						
9	---						
10	5360						
11	1025						
12	880						
13	670						
14	660						
15	---						
16	---						
17	725						
18	805						
19	880						
20	805						
21	7880						
22	8780						
23	705						
24	775						

INSTRUMENTATION DATA

TEST ROAD – BOUMERDES, ALGERIA

Section/Type: B7–2

Location: I

Station: 36+00

DATE OF READING	Jan 29 1960					
AGE OF PAVEMENT IN DAYS	439.1.5					
AIR TEMPERATURE	36° F					

STRAIN GAGE MEASUREMENTS

Gage No.						
1	530					
2	600					
3	4755					
4	2715					
5	1095					
6	1060					
7	795					
8	715					
9	—					
10	5360					
11	1025					
12	850					
13	670					
14	660					
15	—					
16	—					
17	725					
18	805					
19	980					
20	905					
21	7680					
22	8750					
23	705					
24	715					

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	July 13 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	263.03	263.28	263.70	264.26	265.17	283.20	283.42
AIR TEMPERATURE	63 F	68 F	47 F	64 F	66 F	72 F	70 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	----	----	----	.0127	.0102	.0114	.0128
2	----	----	----	.0093	.0057	.0073	.0088
3	----	----	----	.0074	.0069	.0058	.0076
4	----	----	----	.00115	.0116	.0100	.0114
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	66.8	71.0	57.2	84.8	70.8	92.1	87.0
2	61.9	68.3	57.2	74.7	67.2	81.3	87.9
3	59.6	65.1	59.0	71.1	64.5	78.2	88.3
4	60.5	66.0	57.2	73.3	66.3	80.4	87.0
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — EDMONTON, ALBERTA

Section Type B7-2

Location 1 Station 104+00

DATE OF PEAKING	June 22, 1959	June 22, 1959	June 23, 1959	June 24, 1959	June 25, 1959	June 26, 1959
AGE OF PAVEMENT IN DAYS	249.01	263.23	264.70	266.20	267.27	268.23
AIR TEMPERATURE	63 F	68 F	67 F	64 F	66 F	72 F

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No.						
1	-----	-----	----	.0027	.0034	.0028
2	-----	-----	----	.0093	.0097	.0080
3	-----	-----	----	.0044	.0065	.0076
4	-----	-----	----	.0023	.0022	.0024
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No.						
1	66.8	72.0	57.2	84.8	70.8	82.1
2	62.9	64.3	57.2	74.7	67.2	81.3
3	59.6	65.1	59.0	71.1	64.5	78.2
4	61.3	66.0	57.2	73.3	66.3	80.4
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	July 14 1959	July 14 1959	July 14 1959	July 14 1959	July 15 1959	July 30 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	283.75	284.14	284.24	284.40	284.74	299.77	300.03
AIR TEMPERATURE	46 F	73 F	81 F	75 F	55 F	48 F	66 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0305	.0112	.0104	.0116	.0280	.0319	.0165
2	.0263	.0089	.0072	.0079	.0228	.0270	.0120
3	.0246	.0076	.0057	.0078	.0220	.0300	.0101
4	.0234	.0114	.0098	.0105	.0304	.0240	.0133
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	68.5	96.1	99.6	94.4	68.1	64.8	76.6
2	73.8	85.3	90.5	93.1	71.7	67.0	69.0
3	76.0	79.5	84.8	91.8	74.8	70.2	67.2
4	75.1	83.0	88.7	91.4	72.1	67.0	66.8
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD – BOWNESS, ALBERTA

Section Type PT-4

Location 1 **Station** 3+400

DATE OF READING	July 14 1959	Sept. 14 1959	Oct. 14 1959	Nov. 14 1959	Dec. 3 1959	Dec. 28 1959
AGE OF PAVEMENT IN DAYS	283.75	324.14	384.24	424.14	443.77	468.03
AIR TEMPERATURE	64 F	73 F	61 F	75 F	51 F	46 F

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No. 1	.0305	.0112	.0144	.0116	.0086	.0092
2	.0263	.0089	.0074	.0079	.0084	.0070
3	.0246	.0076	.0071	.0075	.0080	.0061
4	.0234	.0114	.0094	.0105	.0094	.0092
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No. 1	68.5	76.2	79.6	74.4	68.2	74.6
2	73.8	85.3	80.5	73.2	71.7	67.0
3	76.0	79.5	84.8	72.6	74.8	70.2
4	75.1	83.0	88.7	71.4	72.1	67.0
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	July 31 1959	Aug 13 1959	Aug 14 1959
AGE OF PAVEMENT IN DAYS	300.25	300.43	300.80	300.97	301.24	314.25	314.79
AIR TEMPERATURE	75 F	70 F	50 F	56 F	82 F	72 F	48 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0113	.0138	.0325	.0234	.0120	.0134	.0393
2	.0073	.0085	.0268	.0180	.0080	.0090	.0347
3	.0055	.0068	.0258	.0175	.0115	.0073	.0338
4	.0100	.0115	.0238	.0158	.0110	.0114	.0322
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	95.0	87.1	62.3	69.5	90.6	82.6	57.2
2	84.5	85.4	65.4	67.2	79.7	71.5	59.9
3	81.9	86.3	69.5	66.3	77.9	69.3	62.6
4	84.1	85.4	66.3	64.5	78.3	72.0	60.8
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD – BOWNESS, ALBERTA

Section Type: BP-2

Location: I Station: 340+00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	Aug 13 1959	Aug 14 1959
AGE OF PAVEMENT IN DAYS	300.25	300.42	300.50	300.97	314.25	314.79
AIR TEMPERATURE	75 F	70 F	50 F	56 F	72 F	68 F

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No.							
1	.0129	.0134	.0225	.0234	.0220	.0134	.0274
2	.0073	.0085	.0268	.0180	.0060	.0090	.0342
3	.0095	.0068	.0256	.0175	.0115	.0073	.0338
4	.0100	.0115	.0238	.0198	.0116	.0114	.0322
5							
6							
7							
8							

PAVEMENT TEMPERATURE (DURABEX PAVEMENT)

Gage No.							
1	95.0	87.2	62.3	69.5	90.6	82.6	72.2
2	84.5	85.4	65.4	67.2	79.7	75.5	75.8
3	81.9	76.3	69.5	66.3	77.9	69.3	62.6
4	84.1	85.4	66.3	64.5	76.3	72.0	68.8
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959	Aug 26 1959	Jan 26 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	315.25	325.23	325.81	326.27	326.82	480.27	480.96
AIR TEMPERATURE	72 F	59 F	41 F	66 F	50 F	11 F	9 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0121	.0122	.0387	.0130	.0325	.0855	.0712
2	.0079	.0082	.0333	.0088	.0268	.0819	.0577
3	.0075	.0080	.0323	.0082	.0258	.0792	.0828
4	.0108	.0110	.0318	.0114	.0241	.0643	.0853
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	85.8	84.0	51.0	81.0	59.0	16.3	9.7
2	80.1	76.4	55.1	77.0	61.7	16.3	10.6
3	76.1	71.5	57.8	73.0	63.5	15.3	11.6
4	77.9	74.7	55.5	75.3	61.7	16.8	10.6
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — ROUNDED ASPHALT

Section Type: BT-3

Location: I [illegible] 204-00

Item	Aug 24, 1959	Aug 31, 1959	Sep 25, 1959	Nov 25, 1959	Dec 29, 1959	Jan 26, 1960	Jan 27, 1960
[illegible]	214.25	204.24	242.82	245.27	236.47	220.37	220.20
[illegible]	72 F	59 F	42 F	46 F	50 F	32 F	0 F
[illegible]							
[illegible]	.0128	.0127	.0130	.0130	.0130	.0125	.0128
[illegible]	.0079	.0082	.0089	.0093	.0094	.0079	.0077
[illegible]	.0075	.0080	.0085	.0082	.0079	.0078	.0083
[illegible]	.0129	.0120	.0136	.0114	.0121	.0085	.0073
[illegible]							
[illegible]							
[illegible]							
[illegible]							
[illegible]							
[illegible]							
[illegible]	85.8	84.0	70.0	80.0	70.0	16.3	2.7
[illegible]	80.2	76.4	59.2	72.0	64.7	15.3	17.0
[illegible]	76.1	72.5	57.8	73.0	62.5	15.3	17.0
[illegible]	72.0	74.1	58.6	72.3	61.7	15.6	16.4
[illegible]							
[illegible]							
[illegible]							
[illegible]							
[illegible]							
[illegible]						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location I **Station** 364+00

DATE OF READING	Jan 29 1960						
AGE OF PAVEMENT IN DAYS	483.18						
AIR TEMPERATURE	38 F						
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0688						
2	.0694						
3	.0642						
4	.0566						
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	32.0						
2	27.3						
3	25.0						
4	26.8						
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD – HOWARD, ALABAMA

Section Type: M7-C2

Location: I Station: 204+00

| | | |

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location II **Station** 357+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	July 13 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	261.97	262.21	262.63	263.25	264.09	282.14	282.35
AIR TEMPERATURE	64 F	66 F	47 F	68 F	66 F	72 F	70 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	305	255	365	210	210	135	135
2	350	290	410	250	250	170	160
3	---	---	---	---	---	---	---
4	2135	2145	2335	2095	2085	2035	2035
5	65	- 5	145	- 45	- 55	-155	-165
6	90	20	190	- 25	- 30	-130	-145
7	370	335	395	330	305	285	285
8	370	335	395	325	305	265	265
9	4490	4290	5010	4230	4215	4120	4100
10	---	---	---	---	---	---	---
11	410	370	440	360	340	315	310
12	395	345	430	345	305	245	230
13	490	445	535	415	405	395	415
14	500	455	530	420	410	370	390
15	---	---	---	---	---	---	---
16	9330	9280	9840	9135	9115	9040	9030
17	425	380	460	360	340	330	345
18	455	415	495	375	365	325	335
19	500	460	580	450	430	440	485
20	485	440	560	400	390	360	390
21	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---
23	380	340	455	315	300	305	335
24	625	370	475	305	290	305	325

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location 11 Station B7-00

DATE OF READING	June 20 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	June 26 1959
NO. OF DAYS PAVEMENT IN SERVICE	261.97	263.21	264.03	264.85	265.74	266.75
AIR TEMPERATURE	64 F	66 F	47 F	64 F	72 F	70 F

(See reverse side for MICROMHOS)

Gage No.						
1	305	295	245	210	234	295
2	350	290	420	250	270	260
3	—	—	—	—	—	—
4	2235	2145	2535	2065	2015	2035
5	65	− 5	245	− 45	−135	−265
6	90	20	190	− 25	−130	−245
7	370	335	295	330	305	285
8	370	335	375	305	365	365
9	4490	4290	5010	4530	4125	4100
10	—	—	—	—	—	—
11	420	370	440	360	315	320
12	395	345	420	345	285	290
13	490	445	525	405	395	415
14	500	455	530	420	470	390
15	—	—	—	—	—	—
16	9320	9280	9640	9235	9140	9030
17	425	360	460	360	330	345
18	455	415	495	375	365	335
19	500	460	580	420	430	440
20	485	440	530	400	390	360
21	—	—	—	—	—	—
22	—	—	—	—	—	—
23	380	340	455	315	300	305
24	625	370	475	305	370	325

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7–2

Location II **Station** 357+00

DATE OF READING	July 14 1959	July 14 1959	July 14 1959	July 14 1959	July 15 1959	July 30 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	282.68	283.06	283.18	283.32	283.68	298.71	298.96
AIR TEMPERATURE	46 F	73 F	81 F	75 F	55 F	48 F	66 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	285	155	100	100	275	355	285
2	230	195	135	140	310	390	320
3	---	---	---	---	---	---	---
4	2295	2055	2025	2015	2355	2545	2255
5	25	-125	-195	-205	5	105	15
6	70	-100	-170	-190	40	160	60
7	365	295	275	265	460	445	405
8	355	285	255	250	345	435	385
9	4675	4165	4090	4070	4595	4980	4450
10	---	---	---	---	---	---	---
11	410	330	295	290	400	480	435
12	365	270	230	215	345	440	385
13	535	415	375	400	525	555	505
14	510	395	355	370	500	540	480
15	---	---	---	---	---	---	---
16	9440	9090	9015	9005	9370	9750	9340
17	450	320	280	300	420	470	420
18	455	345	305	320	455	485	435
19	610	460	425	455	610	650	560
20	530	390	340	365	525	580	490
21	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---
23	475	325	275	315	475	500	415
24	475	310	265	285	445	540	515

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type W-2

Location 11 Station 357+60

DATE OF READING	July 11 1959	July 14 1959	July 14 1959	July 14 1959	July 15 1959	July 30 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	282.68	285.00	286.70	289.32	292.05	307.71	308.91
AIR TEMPERATURE	46 F	75 F	81 F	75 F	55 F	48 F	60 F

SR-4 STRAIN GAGES (MICRO-IN./IN.)

Gage No.							
1	285	145	100	100	275	355	295
2	270	195	135	110	320	290	320
3	---	---	---	---	---	---	---
4	2215	2055	2025	2015	2355	2345	2255
5	95	-125	-145	-205	5	105	15
6	70	-100	-170	-190	40	130	60
7	355	295	275	205	450	445	405
8	355	285	255	250	345	435	385
9	4075	4165	4090	4070	4595	4980	4450
10	---	---	---	---	---	---	---
11	420	330	295	290	400	430	425
12	365	270	230	215	345	440	385
13	355	415	375	400	525	555	505
14	510	395	355	370	500	540	490
15	---	---	---	---	---	---	---
16	9440	9090	9015	9005	9370	9750	9240
17	450	320	280	300	420	470	420
18	455	345	305	320	455	485	435
19	410	400	405	455	630	450	360
20	530	390	340	365	525	460	420
21	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---
23	445	345	275	315	475	500	415
24	425	340	265	295	445	440	395

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7–2

Location II **Station** 357+00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	July 31 1959	Aug 13 1959	Aug 14 1959
AGE OF PAVEMENT IN DAYS	299.18	299.35	299.73	299.90	300.17	313.18	313.72
AIR TEMPERATURE	75 F	68 F	50 F	57 F	82 F	72 F	48 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	240	175	335	325	185	265	425
2	180	200	380	360	210	300	475
3	---	---	---	---	---	---	---
4	2215	2215	2555	2265	2225	2350	2645
5	-145	-125	85	65	-115	- 15	245
6	-120	-105	130	110	- 90	30	320
7	335	345	435	420	355	395	465
8	315	325	415	405	345	385	465
9	4220	4210	4940	4670	4240	4440	5350
10	---	---	---	---	---	---	---
11	360	360	470	455	380	420	520
12	290	285	425	405	305	375	500
13	425	445	565	545	455	495	595
14	400	420	540	520	425	480	580
15	---	---	---	---	---	---	---
16	9140	9135	9700	9485	9165	9320	10160
17	350	370	480	460	380	390	490
18	345	365	485	465	370	435	530
19	450	495	655	610	500	525	670
20	380	425	590	550	430	475	625
21	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---
23	310	355	505	475	350	385	525
24	315	360	535	530	405	---	---

INSTRUMENTATION DATA

TEST ROAD — ROWNESS, ALBERTA

Section Type B7-C

Location 11 Branch 327-00

DATE OF READING	July 20 1959	July 30 1959	July 31 1959	Aug 1 1959	Aug 13 1959	Aug 14 1959
AGE OF PAVEMENT IN DAYS	299.18	299.38	299.78	299.98	312.08	313.78
AIR TEMPERATURE	75 F	68 F	50 F	57 F	82 F	74 F	68 F

SHEAR STRAIN GAGES (MICROINCHES)

Gage No.						
1	240	175	325	310	345	465
2	160	200	320	360	210	200	475
3	---	---	---	---	---	---	---
4	5015	2215	2555	2265	2375	2350	2645
5	-145	-125	95	65	-115	- 55	245
6	-120	-105	120	110	- 50	30	320
7	325	345	455	420	385	395	465
8	315	325	415	405	345	365	455
9	4220	4210	4940	4670	4210	4440	5250
10	---	---	---	---	---	---	---
11	360	360	470	435	360	420	520
12	290	285	425	405	305	375	500
13	425	415	565	515	455	495	595
14	400	420	540	520	420	480	580
15	---	---	---	---	---	---	---
16	9240	9125	9700	9435	9165	9320	10265
17	250	270	460	460	360	390	490
18	245	365	485	465	370	435	530
19	450	405	655	425	700	525	670
20	380	425	590	550	450	475	625
21	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---
23	310	375	505	475	325	385	525
24	315	380	525	550	405	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location II **Station** 357+00

DATE OF READING	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959	Aug 26 1959	Jan 26 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	314.18	324.17	324.74	325.20	325.75	479.21	479.90
AIR TEMPERATURE	72 F	59 F	41 F	66 F	50 F	11 F	10 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	230	---	---	---	---	---	---
2	265	330	520	300	470	1405	1535
3	---	---	---	---	---	---	---
4	2345	2410	2590	2385	2605	1980	1970
5	- 65	20	355	- 15	205	1450	1530
6	- 20	70	430	35	280	1515	1610
7	380	435	495	395	485	645	705
8	365	425	495	390	480	640	695
9	4350	4500	5460	4430	5270	8905	9000
10	---	---	---	---	---	---	---
11	405	465	560	420	530	1340	1420
12	345	415	545	385	515	1385	1480
13	455	575	620	495	605	885	975
14	440	550	605	470	580	890	960
15	---	---	---	---	---	---	---
16	9220	9405	10310	9300	10050	13515	13440
17	370	480	530	410	515	880	950
18	395	495	555	425	535	870	950
19	485	610	710	555	670	1265	1395
20	430	555	670	470	620	1205	1330
21	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---
23	345	465	550	375	525	1050	1140
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD – DOWNIES, ALBERTA

Section Type B7-C

Location 11 Station 37+00

Date of Reading	Aug 14 1979	Aug 23 1979	Aug 27 1979	Aug 29 1979	Sep 26 1979	Oct 27 1980	Mar 29 1981
Air Temperature (°F)	72 F	59 F	42 F	66 F	50 F	12 F	10 F
Gage No.							
1	2710	---	---	---	---	---	---
2	2645	3340	5200	3600	4270	1405	1735
3	---	---	---	---	---	---	---
4	2745	2410	3590	2385	2605	1430	1970
5	- 45	20	35	- 15	305	1430	1950
6	- 20	70	430	35	330	1215	1610
7	2960	4095	4895	3775	4820	6405	7065
8	3605	4525	4895	2980	4780	6140	6995
9	4350	4500	5460	4430	5270	8705	9000
10	---	---	---	---	---	---	---
11	4105	4605	5600	4620	5330	7540	8460
12	3445	4425	5425	3895	5115	7395	8480
13	4455	5775	6220	4895	6005	8885	9775
14	4440	7560	6605	4720	4750	5390	9660
15	---	---	---	---	---	---	---
16	9205	9405	10310	9300	10050	13515	13410
17	5170	4480	5390	4410	5115	6700	8470
18	5915	4495	5425	4405	5115	6770	8530
19	4685	6410	7410	5755	6720	12665	12995
20	4430	7555	6790	4790	6300	12605	13390
21	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---
23	2465	4685	5590	3715	4705	1405	1740
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location II **Station** 357+00

DATE OF READING	Jan 29 1960						
AGE OF PAVEMENT IN DAYS	481.10						
AIR TEMPERATURE	37 F						
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---						
2	1175						
3	---						
4	1345						
5	1245						
6	1305						
7	670						
8	665						
9	8270						
10	---						
11	1165						
12	1200						
13	935						
14	920						
15	---						
16	12615						
17	930						
18	935						
19	1160						
20	1095						
21	---						
22	---						
23	985						
24	---						

INSTRUMENTATION DATA

Section Type: 37-2
Location: 11 Station: 37+00

Date of Reading	Jan 29 1960
Account Number	1401.10
Air Temperature	27° F

Gage No.	
1	---
2	1175
3	---
4	1245
5	1245
6	1305
7	670
8	665
9	8270
10	---
11	1165
12	1200
13	735
14	920
15	---
16	1*1215
17	930
18	935
19	1160
20	1095
21	---
22	---
23	985
24	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location II **Station** 357+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	July 13 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	261.97	262.21	262.63	263.25	264.09	282.14	282.35
AIR TEMPERATURE	64 F	66 F	47 F	68 F	66 F	72 F	70 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	----	----	----	.0074	.0071	.0060	.0092
2	----	----	----	.0023	.0048	.0046	.0026
3	----	----	----	.0139	.0161	.0113	.0137
4	----	----	----	.0035	.0063	.0014	.0036
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	60.9	67.8	57.6	73.7	63.5	84.7	80.5
2	64.0	68.7	57.2	80.4	65.8	87.8	80.5
3	69.0	73.6	56.7	86.1	69.4	94.7	80.0
4	61.3	67.8	57.2	76.0	64.9	83.9	78.3
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD - COLORADO AVENUE

Section Type: B7-C

Location: I1 Station: 347+00

Date Reading	June 22 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	June 26 1959
Age of Pavement in Days	261.97	262.82	263.63	263.45	264.07	265.14
Air Temp. °F	64 F	66 F	47 F	58 F	72 F	72 F
Gage No.						
1	-----	-----	-----	.0074	.0071	.0065
2	-----	-----	-----	.0025	.0045	.0046
3	-----	-----	-----	.0039	.0031	.0039
4	-----	-----	-----	.0035	.0044	.0030
5						
6						
7						
Gage No.						
1	60.9	67.8	71.5	73.7	63.5	60.3
2	64.0	68.7	71.2	70.4	65.3	63.8
3	69.0	72.6	74.6	76.3	69.4	68.7
4	61.3	67.8	71.2	76.0	64.9	63.9
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location II **Station** 357+00

DATE OF READING	July 14 1959	July 14 1959	July 14 1959	July 14 1959	July 15 1959	July 30 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	282.68	283.06	283.18	283.32	283.68	298.71	298.96
AIR TEMPERATURE	46 F	73 F	81 F	75 F	55 F	48 F	66 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0301	.0067	.0060	.0068	.0270	.0304	.0095
2	.0233	.0015	.0010	.0013	.0192	.0245	.0041
3	.0332	.0123	.0116	.0125	.0293	.0339	.0138
4	.0170	.0025	.0016	.0026	.0137	.0175	.0037
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	74.2	82.2	90.0	90.1	73.0	68.5	68.0
2	71.1	85.3	96.6	92.3	70.3	65.3	71.2
3	66.2	96.1	103.0	94.0	67.2	63.0	76.9
4	72.9	82.6	89.2	89.2	72.5	66.6	68.0
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — SOUTHBOUND LANE

Section Type: Rf-3

Operator: JL Station: 237+00

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7–2

Location II **Station** 357+00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	July 31 1959	Aug 13 1959	Aug 14 1959
AGE OF PAVEMENT IN DAYS	299.18	299.35	299.73	299.90	300.17	313.18	313.72
AIR TEMPERATURE	75 F	68 F	50 F	57 F	82 F	72 F	48 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0045	.0070	.0298	.0186	.0057	.0081	.0395
2	-.0004	.0011	.0231	.0127	.0008	.0012	.0328
3	.0102	.0117	.0324	.0215	.0113	.0083	.0433
4	.0003	.0022	.0159	.0073	.0015	.0019	.0257
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	82.7	85.8	67.9	65.9	78.3	71.1	60.0
2	84.1	86.3	63.6	65.9	80.1	72.0	57.7
3	95.0	86.3	60.5	68.6	83.2	81.7	53.6
4	81.4	84.1	66.3	65.9	77.9	69.3	59.0
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST RUN — SUMMARY DATA

Section Type WT-2

Location I1 Station 337+00

Date Of Test	July 25, 1959		July 31, 1959		Aug 12, 1959	
Air Temperature	75 F	82 F	70 F	87 F	82 F	72 F
Elapsed Time (Days)	289.18	294.35	287.73	289.96	300.17	323.36

Gauge Water Measurements (Inches)

Plug No						
1	.0064	.0070	.0098	.0256	.0057	.0075
2	-.0004	.0011	.0021	.0127	.0004	.0028
3	.0102	.0117	.0281	.0215	.0039	.0043
4	.0059	.0082	.0259	.0075	.0015	.0027
5						
6						
7						
8						

Pavement Temperatures (Degrees Fahrenheit)

Gage No						
1	92.7	85.8	57.2	65.9	78.3	73.2
2	84.1	86.3	63.3	65.9	80.1	72.0
3	95.0	96.3	60.5	66.6	83.2	81.7
4	87.4	94.1	66.3	67.9	77.5	66.3
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location II **Station** 357+00

DATE OF READING	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959	Aug 26 1959	Jan 26 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	314.18	324.17	324.74	325.20	325.75	479.21	479.90
AIR TEMPERATURE	72 F	59 F	41 F	66 F	50 F	11 F	10 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0068	.0076	.0407	.0078	.0320	.1068	.0993
2	.0002	.0010	.0353	.0010	.0256	----	----
3	.0116	.0115	.0443	.0118	.0353	.1259	.1275
4	.0013	.0013	.0270	.0021	.0190	.0899	.0815
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	76.6	61.6	56.5	74.4	61.7	13.5	9.7
2	81.0	77.7	54.6	78.3	59.0	14.0	10.1
3	84.5	83.0	51.0	81.0	58.1	15.5	9.2
4	77.0	72.9	56.0	74.8	60.0	13.5	----
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TIES ROAD — BOWMAN, ALBERTA

Section Type: SY-2

Location: 11 Station: 2+7+00

DATE OF READING	Aug 14 1979	Aug 22 1979	Aug 29 1979	Sep 5 1979	Sep 26 1979	Oct 27 1979
AGE OF PAVEMENT IN DAYS	214.20	222.21	229.24	237.33	257.23	278.99
AIR TEMPERATURE	72 F	59 F	71 F	66 F	50 F	31 F

Change among Data Gathering Periods

Plug No						
1	.0006	.0176	.0467	.0694	.1298	.0000
2	.0009	.0230	.0523	.0720	.0829	----
3	.0116	.0239	.0449	.0734	.1355	.1395
4	.0123	.0203	.0490	.0690	.1290	.0000
5						
6						
7						
8						

Dynamic Flow Number (Passes / Hour)

Gage No						
1	76.6	71.0	54.2	72.4	71.9	79.5
2	81.0	73.1	54.6	78.2	75.0	74. 70.1
3	84.5	83.0	51.0	61.4	79.1	71.2
4	77.0	72.9	55.0	71.6	80.0	73.5 ----
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location II **Station** 357+00

DATE OF READING	Jan 29 1960						
AGE OF PAVEMENT IN DAYS	481.10						
AIR TEMPERATURE	37 F						
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0862						
2	----						
3	.1110						
4	.0704						
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	25.4						
2	27.8						
3	31.0						
4	26.4						
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD - [illegible]

Section Type [illegible]

Location [illegible]

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	July 13 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	258.78	259.01	259.45	261.01	261.90	279.95	280.16
AIR TEMPERATURE	64 F	67 F	48 F	66 F	68 F	72 F	68 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	265	245	335	175	195	145	165
7	280	245	335	170	195	115	125
8	285	245	335	160	185	95	105
9	3100	3050	3380	2965	2990	---	---
10	7270	7235	7485	7150	7175	7100	7135
11	100	70	160	- 5	20	- 30	0
12	340	310	395	235	260	---	---
13	425	395	545	295	335	235	255
14	415	395	530	295	340	250	280
15	145	110	385	0	50	- 65	- 30
16	245	210	500	105	150	45	80
17	345	305	495	200	245	145	175
18	500	460	655	365	410	290	320
19	300	280	400	175	220	110	130
20	280	250	380	140	185	40	70
21	6840	6810	7130	6690	6745	6610	6640
22	---	---	---	---	---	---	---
23	300	285	410	185	225	110	120
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD – NORWEGS, ALBERTA

Section Type BP-1

Location 1.1E Station 73+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	254.75	259.01	259.45	261.01	261.90	280.16
AIR TEMPERATURE	64 F	67 F	48 F	56 F	68 F	68 F

12-in STRAIN GAGE INSTALLATION

Gage No.							
1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	265	245	335	175	195	145	165
7	280	245	335	170	195	115	135
8	285	245	335	160	185	95	105
9	3100	3050	3380	2965	2990	---	---
10	7270	7435	7485	7250	7175	7100	7135
11	100	70	160	- 5	20	- 30	0
12	340	330	395	295	260	---	---
13	425	395	545	595	335	295	285
14	415	395	530	295	340	250	280
15	145	110	385	0	50	- 65	- 30
16	215	210	500	105	150	45	80
17	345	305	495	200	245	145	175
18	500	450	655	365	410	090	320
19	300	280	400	275	220	110	130
20	280	250	350	140	185	40	70
21	6840	6810	7130	6695	6745	6610	6610
22	---	---	---	---	---	---	---
23	300	285	420	185	225	110	130
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	July 14 1959	July 14 1959	July 14 1959	July 14 1959	July 15 1959	July 30 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	280.49	280.87	280.98	281.13	281.48	296.52	296.77
AIR TEMPERATURE	45 F	77 F	81 F	75 F	55 F	48 F	68 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	245	165	95	105	255	365	295
7	205	135	60	65	215	345	285
8	195	115	55	55	220	330	265
9	---	---	---	---	---	---	---
10	7395	7125	7020	7045	7360	7535	7295
11	70	- 15	- 90	- 70	70	190	125
12	---	---	---	---	---	---	---
13	425	255	195	215	405	375	295
14	420	275	220	240	400	380	300
15	270	- 30	-100	- 85	225	245	25
16	390	70	0	25	340	360	130
17	385	165	105	130	365	345	225
18	520	320	260	270	490	510	390
19	285	135	75	80	260	240	170
20	240	90	20	25	220	200	135
21	6990	6650	6570	6585	6930	6990	6710
22	---	---	---	---	---	---	---
23	285	130	70	80	265	240	170
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type: ET-2

Location: [illegible] **Station:** 33[illegible]+

DATE OF READING	July 14 1959	July 14 1954	July 14 1959	July 14 1959	July 20 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	200.17	200.87	200.96	201.33	206.46	210.57
AIR TEMPERATURE	45 F	77 F	81 F	75 F	55 F	46 F

56-A STRAIN GAGES (MICRO-IN/IN)

Gage No.							
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	245	165	95	105	255	195	255
7	205	135	60	65	215	145	295
8	195	115	55	55	220	320	265
9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	1395	1420	1420	1415	1360	1355	1295
11	70	- 15	- 30	- 10	70	120	120
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	425	425	195	215	405	375	295
14	470	375	220	210	400	360	300
15	270	- 20	-100	- 85	265	245	25
16	390	70	0	25	340	360	130
17	365	165	105	130	365	345	285
18	550	320	285	270	490	320	185
19	285	135	75	80	210	240	170
20	240	80	20	25	220	200	135
21	5990	6470	6570	6525	5930	5920	6170
22	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
23	285	130	10	60	265	240	170
24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	July 31 1959	Aug 13 1959	Aug 14 1959
AGE OF PAVEMENT IN DAYS	296.98	297.16	297.54	297.71	297.97	310.98	311.53
AIR TEMPERATURE	75 F	66 F	50 F	64 F	77 F	72 F	48 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	225	275	365	315	255	335	425
7	215	250	345	310	245	335	430
8	195	230	325	290	220	305	405
9	---	---	---	---	---	---	---
10	7195	7245	7530	7345	7230	7330	7735
11	50	100	190	145	80	155	250
12	---	---	---	---	---	---	---
13	160	295	460	415	275	325	525
14	180	320	460	420	300	330	520
15	-135	5	325	160	- 15	55	465
16	- 30	120	440	260	95	160	610
17	85	225	435	355	205	260	545
18	245	380	595	515	360	420	690
19	40	170	325	285	155	210	360
20	- 20	110	290	250	95	170	310
21	6540	6670	7060	6845	6660	6740	7290
22	---	---	---	---	---	---	---
23	30	160	320	280	140	200	340
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD – BOWNESS, ALBERTA

Section Type 37-J

Location III **Station** 334+00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	Aug 21 1959	Aug 22 1959
AGE OF PAVEMENT IN DAYS	296.98	297.16	297.54	297.73	318.97	319.98
AIR TEMPERATURE	75 F	66 F	50 F	64 F	77 F	72 F

SR-4 STRAIN GAGES (MICRO-IN./IN.)

Gage No.							
1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	225	275	305	315	325	325	345
7	215	250	345	270	340	335	350
8	195	230	325	290	320	305	405
9	---	---	---	---	---	---	---
10	1295	1245	1350	1345	1230	1230	1295
11	50	100	190	145	80	155	295
12	---	---	---	---	---	---	---
13	160	295	460	415	275	325	525
14	180	320	460	420	300	330	520
15	-135	5	325	160	- 15	35	465
16	- 20	120	420	250	95	160	620
17	85	225	435	355	205	260	545
18	245	380	595	515	360	420	650
19	40	170	325	295	150	210	350
20	- 20	120	290	250	95	170	320
21	6540	6870	7020	6645	6640	6740	7290
22	---	---	---	---	---	---	---
23	20	160	320	280	140	200	340
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959	Aug 26 1959	Jan 26 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	311.98	321.97	322.54	323.0	323.55	474.0	474.69
AIR TEMPERATURE	72 F	62 F	37 F	66 F	48 F	15 F	9 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	305	445	485	370	465	485	535
7	310	455	505	380	480	675	715
8	275	405	460	335	435	535	580
9	---	---	---	---	---	---	---
10	7295	7425	7855	7360	7645	10275	10495
11	130	260	310	190	300	385	430
12	---	---	---	---	---	---	---
13	265	335	315	315	465	790	845
14	270	340	495	320	450	735	790
15	- 15	75	510	55	335	1415	1775
16	90	170	630	150	450	1585	1840
17	185	260	565	235	425	1355	1475
18	350	430	730	410	590	1520	1650
19	140	220	340	195	320	545	605
20	100	180	310	160	290	480	540
21	6660	6760	7400	6730	7125	9055	9325
22	---	---	---	---	---	---	---
23	140	220	350	200	330	500	560
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

Section Type: RT-2

Location: [illegible] Station: [illegible]

DATE OF READING	May 14 1959	Aug 24 1959	Aug 29 1959	Aug 25 1960	May 24 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	311.96	321.97	326.34	330.0	529.59	174.0	177.46
AIR TEMPERATURE	72 F	62 F	77 F	66 F	46 F	23 F	9 F

1	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---
6	305	445	465	370	465	149	125
7	320	435	505	350	450	675	725
8	275	405	460	335	435	535	560
9	---	---	---	---	---	---	---
10	795	745	7655	7360	7645	10772	12472
11	230	260	320	190	300	285	490
12	---	---	---	---	---	---	---
13	265	235	315	315	465	790	845
14	270	340	495	280	470	745	780
15	- 15	75	210	55	355	1415	1775
16	90	170	630	150	450	1065	1265
17	185	260	565	235	425	1165	1465
18	350	450	730	410	540	1760	1650
19	140	220	340	195	320	745	505
20	100	180	320	160	270	480	540
21	6560	6750	7400	6730	7255	9015	7525
22	---	---	---	---	---	---	---
23	140	220	350	200	310	700	440
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1
Location III **Station** 334+00

DATE OF READING	Jan 29 1960						
AGE OF PAVEMENT IN DAYS	476.92						
AIR TEMPERATURE	36 F						
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---						
2	---						
3	---						
4	---						
5	---						
6	525						
7	700						
8	470						
9	---						
10	9760						
11	415						
12	---						
13	790						
14	745						
15	1025						
16	1105						
17	1110						
18	1275						
19	570						
20	500						
21	8530						
22	---						
23	520						
24	---						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	June 25 1959	July 13 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	258.78	259.01	259.45	261.01	261.90	279.95	280.16
AIR TEMPERATURE	64 F	67 F	48 F	66 F	68 F	72 F	68 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	----	----	----	-.0010	-.0006	-.0011	.0007
2	----	----	----	-.0018	-.0013	-.0027	-.0009
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	59.5	65.9	58.1	75.5	66.7	81.6	78.7
2	63.1	66.4	57.2	79.5	69.0	84.3	79.6
3	70.3	76.2	54.9	81.7	73.4	102.4	76.9
4	62.2	67.3	57.2	78.2	69.0	84.3	78.7
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-2

Location [illegible] **Station** [illegible]

DATE OF READING	June 22 1979	June 22 1979	June 25 1979	June 27 1979	June 29 1979	July 13 1979
AGE OF PAVEMENT IN DAYS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AIR TEMPERATURE	64 F	67 F	48 F	60 F	68 F	72 F

CHECK WITH MEASUREMENTS ON SKID

Plug No.						
1	----	----	----	-.0030	-.0026	-.0012
2	----	----	----	-.0038	-.0032	-.0027
3						
4						
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Code No.						
1	59.5	65.9	58.1	75.5	86.7	82.5
2	53.3	66.4	57.2	71.5	69.0	82.3
3	70.3	76.2	54.9	82.7	73.4	102.4
4	56.2	67.3	57.2	72.5	69.0	84.3
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	July 14 1959	July 14 1959	July 14 1959	July 14 1959	July 15 1959	July 30 1959	July 30 1959
AGE OF PAVEMENT IN DAYS	280.49	280.87	280.98	281.13	281.48	296.52	296.77
AIR TEMPERATURE	45 F	77 F	81 F	75 F	55 F	48 F	68 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0084	-.0004	-.0010	-.0001	.0064	.0088	-.0005
2	.0049	-.0018	-.0024	-.0014	.0035	.0045	-.0013
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	73.3	80.9	88.7	89.2	72.5	67.5	70.3
2	70.2	82.6	94.0	89.6	69.4	64.4	73.4
3	63.5	95.3	103.9	91.8	65.0	60.8	83.5
4	70.2	82.6	93.5	90.5	68.5	64.9	72.5
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWMAN, ALBERTA

Section Type: VT-L

Location: LL1 Station: [illegible]

DATE OF READING						
AGE OF PAVEMENT IN DAYS						
AIR TEMPERATURE						

CRACK WIDTH MEASUREMENTS (inches)

Gage No.						
1						
2						
3						
4						
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No.						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	July 31 1959	Aug 13 1959	Aug 14 1959
AGE OF PAVEMENT IN DAYS	296.98	297.16	297.54	297.71	297.97	310.98	311.53
AIR TEMPERATURE	75 F	66 F	50 F	64 F	77 F	72 F	48 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-.0010	-.0003	.0087	.0007	-.0004	-.0010	.0148
2	-.0018	-.0012	.0047	-.0003	-.0012	-.0018	.0091
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	79.7	84.1	68.6	65.0	77.5	68.3	60.9
2	83.2	85.0	65.9	66.3	79.7	73.2	59.5
3	96.3	84.1	61.8	71.3	90.6	81.6	53.6
4	84.1	85.0	65.9	66.3	81.0	73.2	58.1
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type PCC-1

Location 111 **Station** 0+00.00

DATE OF READING	July 30 1959	July 30 1959	July 31 1959	July 31 1959	Aug 31 1959	Aug 31 1959
AGE OF PAVEMENT IN DAYS	196.9%	201.1b	209.5E	217.1I	237.0D	237.0D
AIR TEMPERATURE	75 F	65 F	50 F	44 F	72 F	72 F

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No.						
1	-.0010	-.0022	.0027	.0027	-.0020	-.0024
2	-.0028	-.0042	.0047	-.0049	-.0018	.0017
3						
4						
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Plug No.						
1	72.7	64.2	56.6	52.0	72.5	70.3
2	63.2	55.0	45.9	40.3	79.7	72.2
3	64.3	54.1	41.8	31.5	60.6	53.6
4	64.1	55.0	45.9	40.3	61.0	72.2
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959	Aug 26 1959	Jan 26 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	311.98	321.97	322.54	323.0	323.55	474.0	474.69
AIR TEMPERATURE	72 F	62 F	37 F	66 F	48 F	15 F	9 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-.0006	-.0003	.0145	-.0006	.0099	.0710	.0639
2	-.0018	-.0019	.0095	-.0016	.0047	.0818	.0444
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	75.3	72.0	57.8	72.1	61.7	11.6	10.6
2	79.2	73.8	55.5	74.4	60.0	13.0	10.6
3	83.6	83.0	51.0	78.3	57.7	15.5	9.7
4	78.8	75.6	53.3	74.8	60.4	13.0	10.1
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

Section Type S7-3

Location 111 **Station** 2+00 E

DATE OF READING	May 14 1959	May 28 1959	June 25 1959	Aug. 20 1959	Sept. 25 1959	Oct. 29 1959
AGE OF PAVEMENT IN DAYS	212.00	226.91	253.94	292.0	331.05	366.0
AIR TEMPERATURE	72 F	68 F	77 F	84 F	68 F	58 F

CRACK WIDTH MEASUREMENTS INCHES

Plug No.							
1	-.0006	-.0013	.0017	.0006	.0012	.0027	
2	-.0026	-.0039	.0095	-.0006	.0017	.0028	.0044
3							
4							
5							
6							
7							
8							

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No.							
1	75.3	75.0	72.8	72.1	67.7	73.6	70.4
2	79.2	79.4	75.5	74.4	69.0	73.0	70.3
3	84.6	83.0	81.0	76.3	71.7	74.3	9.8
4	78.8	77.6	73.3	74.8	69.4	73.0	70.2
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B7-1

Location III **Station** 334+00

DATE OF READING	Jan 29 1960						
AGE OF PAVEMENT IN DAYS	476.92						
AIR TEMPERATURE	36 F						
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0517						
2	.0333						
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	25.4						
2	26.9						
3	30.1						
4	26.9						
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD – NOWATA, ALBERTA

Section Type V7-1

Location III Station 2+00

DATE OF READING	Jan 27 1960
AGE OF PAVEMENT IN DAYS	475.92
AIR TEMPERATURE	36 F

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No. 1	.0317
2	.0323
3	
4	
5	
6	
7	
8	

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No. 1	25.4
2	26.9
3	20.1
4	26.9
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-1

Location VI **Station** 304+00

DATE OF READING	June22 1959	June22 1959	June23 1959	June25 1959	Jul 15 1959	Jul 16 1959	Jul 16 1959
AGE OF PAVEMENT IN DAYS	249.16	249.39	249.85	252.28	272.30	273.09	273.25
AIR TEMPERATURE	66 F	64 F	46 F	62 F	74 F	70 F	73 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---	---	---	---	---	---	---
2	360	320	340	-170	-1600	-1380	-1505
3	150	100	335	-320	-1600	-1320	-1460
4	---	---	---	---	---	---	---
5	80	40	100	-390	-1650	-1370	75
6	100	55	100	-400	-1610	-1375	60
7	215	180	215	-310	-1545	-1345	-55
8	240	200	215	-350	-1530	-1330	-50
9	- 5	- 45	55	-535	-1835	-1595	- 300
10	---	---	---	---	---	---	---
11	195	160	200	-340	-1570	-1340	460
12	180	145	175	-325	-1525	-1310	---
13	---	---	---	---	---	---	---
14	260	220	350	240	- 40	30	- 970
15	220	175	310	145	-1155	-1030	-1445
16	145	105	230	85	-1015	- 935	---
17	285	245	360	260	- 140	- 85	-1685
18	300	265	370	295	35	95	-1495
19	310	295	385	240	- 155	- 90	-1510
20	305	295	385	315	70	135	-1265
21	315	280	395	285	- 45	25	-1435
22	330	300	415	330	- 80	- 20	---
23	340	315	415	355	95	155	-1780
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — ADVANCE ALLEY

Station Type: DE-2

Location: V1 Station: 204+70

DATE OF READING	June 22 1959	June 23 1959	June 24 1959	June 25 1959	June 26 1959	June 27 1959	June 28 1959
AIR TEMPERATURE	66 F	61 F	46 F	62 F	74 F	70 F	72 F
	249.15	240.32	240.85	242.24	272.30	272.00	273.00
	---	---	---	---	---	---	---
1	76	240	140	-270	-1560	-1500	-1505
2	140	100	235	-350	-1600	-1320	-1460
3	---	---	---	---	---	---	---
4	60	40	100	-300	-1650	-1310	75
5	100	55	130	-400	-1610	-1375	50
6	215	180	215	-310	-1545	-1345	-55
7	240	200	225	-350	-1530	-1330	-50
8	- 5	- 45	35	-535	-1835	-1595	- 300
9	---	---	---	---	---	---	---
10	125	160	200	-340	-1570	-1340	-60
11	120	145	175	-325	-1425	-1310	---
12	---	---	---	---	---	---	---
13	260	220	250	240	- 40	- 20	- 270
14	220	125	210	134	-1255	-1090	-1415
15	105	105	220	145	-1015	- 925	---
16	205	245	250	- 140	- 85		-1695
17	300	265	270	264	35	65	-1490
18	220	225	285	240	- 155	- 60	-1520
19	205	245	215	70	134		-1260
20	240	240	205	185	- 45	25	-1320
21	330	300	125	235	- 50	- 20	---
22	340	315	115	235	65	145	-1350
23	---	---	---	---	---	---	---
24							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-1

Location VI **Station** 304+00

DATE OF READING	Jul 16 1959	Jul 17 1959	Jul 17 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 31 1959
AGE OF PAVEMENT IN DAYS	273.45	273.82	274.09	298.27	298.83	299.29	319.30
AIR TEMPERATURE	77 F	48 F	72 F	72 F	39 F	70 F	54 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---	---	---	---	---	---	---
2	-1400	-1250	-1280	-1350	-1085	-1190	-1490
3	-1365	-1015	-1215	-1250	- 430	-1100	-1360
4	---	---	---	---	---	---	---
5	-1385	-1220	-1250	-1330	- 920	-1170	-1530
6	-1390	-1230	-1270	-1340	- 950	-1195	-1565
7	-1330	-1215	-1245	-1280	-1055	-1155	-1525
8	-1300	-1195	-1230	-1275	-1065	-1140	-1530
9	-1620	-1415	-1505	-1635	-1085	-1480	-1905
10	---	---	---	---	---	---	---
11	-1350	-1210	-1230	-1280	- 960	-1330	-1500
12	-1325	-1190	-1210	-1255	- 935	-1110	-1490
13	---	---	---	---	---	---	---
14	10	80	5	- 80	30	- 120	20
15	-1025	- 945	- 995	-1135	- 845	-1095	- 935
16	- 975	- 890	- 945	-1080	- 770	-1025	- 875
17	- 105	- 65	- 115	- 235	- 115	- 255	- 195
18	75	125	65	- 15	100	- 55	70
19	- 100	- 60	- 120	- 200	- 120	- 235	- 120
20	125	175	105	15	70	- 65	85
21	5	65	0	- 115	- 10	-145	35
22	- 30	20	- 40	- 130	- 50	- 170	- 50
23	145	185	125	45	185	0	125
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST BOND — PRESSES, ASSEMBLY

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-1
Location VI **Station** 304+00

DATE OF READING	Sept 1 1959	Sept 1 1959	Sept 2 1959	Jan 26 1959	Jan 27 1959	Jan 29 1959	
AGE OF PAVEMENT IN DAYS	319.84	320.31	320.84	467.34	468.04	470.25	
AIR TEMPERATURE	34 F	62 F	37 F	13 F	8 F	36 F	
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---	---	---	---	---	---	
2	-810	-820	-640	890	945	930	
3	- 60	-710	- 10	2205	2585	1795	
4	---	---	---	---	---	---	
5	-590	-850	-520	945	1010	920	
6	-630	-885	-565	935	995	915	
7	-855	-855	-695	355	395	400	
8	-850	-840	-680	310	355	355	
9	-865	-1255	-815	1630	1920	1270	
10	---	---	---	---	---	---	
11	-660	-810	-550	650	705	685	
12	-665	-800	-535	605	660	640	
13	---	---	---	---	---	---	
14	90	- 40	110	465	515	505	
15	-665	-955	-685	990	1020	940	
16	-615	-910	-645	985	935	820	
17	- 75	-235	- 95	705	745	735	
18	125	25	160	720	760	750	
19	- 70	-170	- 50	550	590	540	
20	125	20	145	535	575	550	
21	35	- 85	55	520	570	180	
22	- 5	-100	25	615	660	645	
23	245	65	215	760	710	760	
24	---	---	---	---	---	---	

INSTRUMENTATION DATA

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-1

Location VI **Station** 304+00

DATE OF READING	June22 1959	June22 1959	June23 1959	June25 1959	Jul 15 1959	Jul 16 1959	Jul 16 1959
AGE OF PAVEMENT IN DAYS	249.16	249.39	249.85	252.28	272.30	273.09	273.25
AIR TEMPERATURE	66 F	64 F	46 F	62 F	74 F	70 F	73 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	---	---	---	-.0107	-.0108	-.0098	-.0114
2	---	---	---	-.0014	-.0004	.0001	-.0008
3	---	---	---	-.0006	.0005	.0010	-.0002
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	66.6	69.9	57.2	65.3	79.1	69.0	87.5
2	69.8	69.4	56.3	65.3	79.1	71.2	89.7
3	76.4	76.1	54.5	68.5	85.7	78.3	96.6
4	68.9	70.3	56.7	65.3	77.8	71.2	88.4
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — ROMORSS, ALBERTA

Section Type: AC-1

Location: V1 Station: 10+00

DATE OF READING	1959	1959	1959	1959		
AGE OF PAVEMENT IN DAYS	1	2	3	4		
AIR TEMPERATURE						
Plug No. 1	---	---	---	---		
2	---	---	---	---		
3	---	---	---	---		
4						
5						
6						
7						
8						
Gage No. 1	66.1	69.9	72.2	69.1	70.1	70.1
2	69.2	67.4	74.2	68.7	70.1	70.1
3	70.4	76.1	74.5	69.5	75.1	70.2
4	69.4	70.3	76.7	69.1	72.8	70.4
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-1
Location VI **Station** 304+00

DATE OF READING	Jul 16 1959	Jul 17 1959	Jul 17 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 31 1959
AGE OF PAVEMENT IN DAYS	273.45	273.82	274.09	298.27	298.83	299.29	319.30
AIR TEMPERATURE	77 F	48 F	72 F	72 F	39 F	70 F	54 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-.0106	-.0077	-.0102	-.0113	-.0082	-.0120	-.0096
2	-.0002	.0053	.0003	.0008	.0165	-.0007	0
3	.0007	.0046	.0008	.0015	.0103	0	.0010
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	87.1	69.5	73.0	80.9	60.8	81.5	58.2
2	85.0	68.1	75.7	82.2	58.5	92.8	59.1
3	87.1	65.9	83.2	88.7	54.5	100.2	60.0
4	85.4	68.1	74.8	82.2	58.1	92.4	59.1
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — NOWHERE, ALBERTA

Section Type: RC-1

Location: V3 Station 7015+00

DATE OF READING	Dec 17 1959	Jan 17 1960	Feb 17 1960	Mar 20 1960	Apr 22 1960	May 22 1960	Jun 22 1960
ADJ. OF PAVEMENT IN DAYS	279.45	313.62	341.30	369.27	[illegible]	509.84	540.50
AIR TEMPERATURE	27 F	46 F	72 F	75 F	81 F	70 F	64 F
BLACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-.0104	-.0077	-.0070	-.0070	-.0064	-.0064	-.0064
2	-.0092	.0000	.0003	.0000	.0000	-.0007	0
3	.0007	.0004	.0008	.0015	.0020	0	.0013
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	87.1	69.5	73.0	80.9	80.5	81.5	58.5
2	85.0	66.1	75.7	82.2	82.5	78.4	59.1
3	87.1	63.9	83.2	86.7	84.5	100.2	60.6
4	85.6	68.1	78.8	82.3	84.1	92.6	55.1
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-1
Location VI **Station** 304+00

DATE OF READING	Sept 1 1959	Sept 1 1959	Sept 2 1959	Jan 26 1959	Jan 27 1959	Jan 29 1959	
AGE OF PAVEMENT IN DAYS	319.84	320.31	320.84	467.34	468.04	470.25	
AIR TEMPERATURE	34 F	62 F	37 F	13 F	8 F	36 F	
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-.0086	-.0118	-.0092	---	---	---	
2	.0128	-.0019	.0099	.0685	0718	0699	
3	.0074	-.0007	.0058	.0417	0432	0362	
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	49.6	70.8	53.2	11.6	7.8	25.4	
2	48.2	72.1	50.5	10.6	7.3	27.8	
3	44.5	77.9	48.2	11.6	7.8	30.1	
4	47.4	72.1	51.4	10.6	7.3	26.9	
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-2

Location IX **Station** 289+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	July 16 1959	July 16 1959	July 16 1959
AGE OF PAVEMENT IN DAYS	245.08	245.40	245.76	246.13	269.0	269.17	269.34
AIR TEMPERATURE	64 F	52 F	45 F	66 F	70 F	73 F	70 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	415	430	515	410	375	305	340
2	410	415	510	140	---	---	---
3	350	375	495	305	- 55	-125	- 75
4	320	330	460	270	70	- 10	35
5	440	455	500	440	330	265	310
6	420	445	500	410	370	290	330
7	390	430	500	430	395	335	380
8	---	---	---	---	---	---	---
9	300	320	430	325	240	170	220
10	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---
12	300	320	360	300	255	175	230
13	190	350	160	95	---	---	---
14	205	370	195	105	310	275	325
15	30	210	105	- 60	150	110	165
16	50	250	180	- 45	160	120	180
17	150	325	120	60	240	220	270
18	150	315	115	65	265	245	290
19	125	300	95	55	275	275	335
20	140	310	105	65	270	265	315
21	35	275	195	- 65	185	145	245
22	-210	40	0	-320	- 65	-100	- 10
23	---	---	---	---	---	---	---
24	85	275	65	5	205	185	255

INSTRUMENTATION DATA

TEST ROAD – DOWNES, ALBERTA

Section Type: 46-2

Location: 1R Station: 67+00

DATE OF READING	June 22 1959	June 23 1959	June 24 1959	July 3 1959	July 13 1959	July 24 1959
AGE OF PAVEMENT IN DAYS	243.08	244.40	245.75	254.13	264.0	284.17	294.34
AIR TEMPERATURE	64 F	52 F	45 F	66 F	76 F	73 F	70 F

Gage No.							
1	415	430	515	410	375	395	340
2	410	415	510	340	----	----	----
3	350	375	495	305	- 55	-125	- 75
4	320	330	460	270	70	- 10	35
5	440	455	500	440	330	365	270
6	420	445	500	420	370	390	340
7	390	430	500	420	395	395	350
8	----	----	----	----	----	----	----
9	300	320	430	325	240	270	200
10	----	----	----	----	----	----	----
11	----	----	----	----	----	----	----
12	300	320	360	300	255	275	230
13	190	350	160	05	----	----	----
14	205	370	195	105	310	295	225
15	30	210	105	- 30	150	110	165
16	50	250	180	- 45	160	140	180
17	150	325	120	60	240	220	270
18	150	315	115	65	265	245	270
19	125	300	95	55	275	275	295
20	140	210	105	65	270	295	215
21	35	225	195	- 65	165	145	245
22	-110	40	0	-320	- 65	-120	- 10
23	----	----	----	----	----	----	----
24	65	275	65	5	205	185	255

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6–2

Location IX **Station** 289+00

DATE OF READING	July 17 1959	July 17 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 31 1959	Sept 1 1959
AGE OF PAVEMENT IN DAYS	269.73	270.01	294.19	294.75	295.20	314.21	314.75
AIR TEMPERATURE	48 F	72 F	72 F	39 F	70 F	54 F	34 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	475	405	340	635	315	225	550
2	---	---	---	---	---	---	---
3	80	- 15	- 15	670	- 15	30	455
4	195	95	- 60	270	-100	-350	80
5	390	360	280	425	250	250	370
6	430	395	370	540	340	440	590
7	510	420	350	625	320	310	610
8	---	---	---	---	---	---	---
9	380	260	230	650	200	270	780
10	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---
12	315	270	270	370	240	310	370
13	---	---	---	---	---	---	---
14	375	275	315	-635	-645	-1465	-765
15	300	120	150	-490	-815	-1630	-620
16	380	130	180	-310	-800	-1590	-470
17	280	210	260	-730	-700	-1540	-980
18	295	240	270	-720	-685	-1525	-965
19	325	255	305	-685	-655	-1500	-945
20	305	240	285	-710	-665	-1505	-970
21	445	145	245	-275	-745	-1475	-415
22	260	-110	- 10	-380	-1010	-1850	-740
23	---	---	---	---	---	---	---
24	265	175	235	-745	-725	-1540	-995

INSTRUMENTATION DATA

TEST ROAD – BOWNESS, ALBERTA

Section Type: No-2

Location: IX

Station: 0+00

Gage No.						
1	475	405	340	435	325	530
2	---	---	---	---	---	---
3	80	- 15	170	- 15	20	455
4	195	90	270	-100	-130	80
5	360	280	445	250	150	270
6	430	395	270	540	340	520
7	510	420	350	629	350	320
8	---	---	---	---	---	---
9	350	260	230	650	200	270
10	---	---	---	---	---	---
11	---	---	---	---	---	---
12	315	270	370	240	310	370
13	---	---	---	---	---	---
14	375	275	315	-635	-645	-765
15	300	120	150	-490	-515	-620
16	340	130	180	-370	-800	-470
17	280	220	180	-730	-700	-760
18	295	240	270	-720	-655	-765
19	325	275	305	-685	-695	-745
20	305	240	285	-710	-565	-710
21	445	345	215	-715	-715	-715
22	260	-110	- 10	-360	-1010	-140
23	---	---	---	---	---	---
24	260	175	235	-715	-725	-795

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-2

Location IX **Station** 289+00

DATE OF READING	Sept 1 1959	Sept 2 1959	Jan 26 1960	Jan 27 1960	Jan 29 1960		
AGE OF PAVEMENT IN DAYS	315.22	315.75	462.25	462.94	465.15		
AIR TEMPERATURE	62 F	36 F	11 F	6 F	35 F		
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	195	515	1315	1375	875		
2	---	---	---	---	---		
3	25	425	1475	1325	880		
4	-390	10	1460	1635	850		
5	210	380	980	1610	835		
6	390	585	1000	1005	845		
7	265	570	1515	1600	930		
8	---	---	---	---	---		
9	225	690	1695	1790	-525		
10	---	---	---	---	---		
11	---	---	---	---	---		
12	260	390	630	635	515		
13	---	---	---	---	---		
14	-155	130	1080	1120	630		
15	-330	210	4795	4975	3975		
16	-305	370	4295	4505	3395		
17	-230	- 20	500	495	365		
18	-205	- 15	485	480	355		
19	-195	15	435	415	290		
20	-200	- 5	445	435	305		
21	-240	445	1595	1780	-510		
22	-615	160	1210	1395	420		
23	---	---	---	---	---		
24	-255	- 25	420	415	285		

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-2

Location IX **Station** 289+00

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	June 24 1959	July 16 1959	July 16 1959	July 16 1959
AGE OF PAVEMENT IN DAYS	245.08	245.40	245.76	246.13	269.0	269.17	269.34
AIR TEMPERATURE	64 F	52 F	45 F	66 F	70 F	73 F	70 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	----	----	----	.0030	.0025	.0019	.0021
2	----	----	----	.0042	.0007	.0005	.0004
3	----	----	----	.0009	-.0013	-.0018	-.0015
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	69.3	65.7	56.3	69.4	75.6	82.7	84.5
2	71.5	65.3	56.3	73.0	78.7	86.3	84.5
3	73.7	62.1	55.9	80.1	85.7	90.6	85.3
4	71.5	65.3	56.3	72.1	78.3	85.8	84.5
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

Section Type	IX-2
Location	IX

Gage No.	Time 1 1955	Time 2 1955	Time 3 1955	Time 4 1955	Time 5 1955	Time 6 1955
DATE OF READING						
AGE OF PAVEMENT IN DAYS	246.00	246.40	246.76	246.79	246.83	246.86
AIR TEMPERATURE	44 F	52 F	45 F	65 F	70 F	73 F
CHECK TEMPERATURES (DEGREES F)						
Thrg No. 1	----	----	----	.0030	.0035	.0029
2	----	----	----	.0042	.0047	.0027
3	----	----	----	.0039	-.0033	-.0028
4						
5						
6						
7						
8						
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)						
Gage No. 1	69.3	65.7	56.3	69.4	75.6	82.7
2	73.5	65.3	56.3	73.0	78.7	86.3
3	73.7	62.1	55.9	60.1	65.7	90.6
4	73.5	65.3	56.3	72.1	77.3	85.6
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-2

Location IX **Station** 289+00

DATE OF READING	July 17 1959	July 17 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 31 1959	Sept 1 1959
AGE OF PAVEMENT IN DAYS	269.73	270.01	294.19	294.75	295.20	314.21	314.75
AIR TEMPERATURE	48 F	72 F	72 F	39 F	70 F	54 F	34 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0082	.0020	.0017	.0120	.0007	.0010	.0123
2	.0063	.0005	.0004	.0173	-.0002	.0004	.0160
3	.0050	-.0016	-.0016	.0164	-.0025	-.0006	.0139
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	68.6	75.3	79.5	58.1	77.5	60.5	50.5
2	66.3	77.5	80.9	56.3	82.7	60.1	48.2
3	64.1	87.6	82.2	53.1	85.4	61.0	43.6
4	65.9	79.7	80.9	55.4	82.7	60.1	46.8
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST WORK — LOCKWOOD ALBERTA

Section Type: B-2

Location: 11.

DATE OF READING							
AGE OF PAVEMENT IN DAYS							
AIR TEMPERATURE							
GAGE WORK (Measurements in Inches)							
Plug No. 1							
2							
3							
4							
5							
6							
7							
8							
MIDLAND TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type B6-2

Location IX **Station** 289+00

DATE OF READING	Sept 1 1959	Sept 2 1959	Jan 26 1960	Jan 27 1960	Jan 29 1960		
AGE OF PAVEMENT IN DAYS	315.22	315.75	462.25	462.94	465.15		
AIR TEMPERATURE	62 F	36 F	11 F	6 F	35 F		
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-.0006	.0104	.0110	.0115	-----		
2	-.0008	.0143	.0311	.0353	.0154		
3	-.0021	.0119	.0239	.0270	.0096		
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	72.1	52.8	11.6	8.7	27.3		
2	74.8	50.5	11.1	8.7	29.2		
3	78.8	48.2	11.1	8.2	31.5		
4	74.8	50.5	11.6	7.8	29.2		
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type: [illegible]

Location: [illegible] Station [illegible]

DATE OF READING	Sept 1 1959	Sept 2 1959	Jan 26 1960	Jan 27 1960	Jan 29 1960	
AGE OF PAVEMENT IN DAYS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
TEMPERATURE	62 F	36 F	11 F	6 F	35 F	

[illegible] WIDTH MEASUREMENTS (INCHES)

Plug No.						
1	-.0006	.0004	.0110	.0115	----	
2	-.0008	.0143	.0311	.0355	.0354	
3	-.0021	.0119	.0279	.0270	.0356	
4						
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No.						
1	72.1	52.3	11.6	8.7	57.2	
2	71.8	50.5	11.1	8.7	29.2	
3	71.8	46.2	11.1	8.2	31.3	
4	71.6	50.5	11.6	7.8	29.2	
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A–6

Location X **Station** 262+50

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	July 16 1959	July 16 1959	July 16 1959	July 17 1959
AGE OF PAVEMENT IN DAYS	227.06	227.32	227.70	250.94	251.09	251.27	251.67
AIR TEMPERATURE	64 F	52 F	46 F	72 F	72 F	70 F	48 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	540	570	630	680	570	580	655
2	---	---	---	---	---	---	---
3	350	515	860	380	260	290	845
4	335	460	680	335	225	245	595
5	390	430	730	625	510	525	840
6	405	455	735	405	305	325	595
7	405	405	455	665	595	635	675
8	---	---	---	---	---	---	---
9	-160	0	515	20	-100	- 50	470
10	-140	70	-280	25	-110	- 40	930
11	450	460	510	700	640	680	710
12	---	---	---	---	---	---	---
13	380	380	420	- 30	- 40	- 10	20
14	365	370	410	- 40	- 50	- 20	5
15	-290	- 90	525	-775	-830	-755	115
16	-425	-210	405	-850	-900	-830	50
17	335	345	375	- 90	-105	- 65	- 45
18	355	365	380	- 45	- 55	- 15	- 5
19	395	395	405	- 15	5	40	40
20	335	340	350	- 55	- 65	- 25	- 25
21	---	---	---	---	---	---	---
22	300	435	925	- 85	-100	- 55	590
23	385	405	415	25	10	35	45
24	370	390	410	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type: A-5

Location: [illegible] Station: [illegible]

DATE OF READING	June 22, 1959	June 22, 1959	June 23, 1959	July 10, 1959	July 25, 1959	July 27, 1959
AGE OF PAVEMENT IN DAYS	227.00	227.12	227.70	237.00	242.00	244.07
AIR TEMPERATURE	64 °F	52 °F	46 °F	72 °F	70 °F	48 °F
Gage No.						
1	340	370	630	680	570	580	625
2	---	---	---	---	---	---	---
3	350	315	660	340	760	740	645
4	425	460	640	395	725	745	595
5	390	430	720	525	520	705	840
6	405	455	735	405	505	385	395
7	405	405	455	665	595	595	675
8	---	---	---	---	---	---	---
9	-160	0	515	20	-100	- 20	470
10	-140	70	-280	25	-120	- 40	330
11	430	460	520	700	640	690	720
12	---	---	---	---	---	---	---
13	390	380	420	- 30	- 40	- 10	50
14	365	370	410	- 40	- 50	- 20	5
15	-200	- 90	525	-725	-830	-725	115
16	-425	-210	405	-650	-900	-830	50
17	335	345	375	- 90	-105	- 65	- 45
18	355	365	380	- 45	- 55	- 15	- 5
19	395	395	405	- 15	5	40	40
20	335	340	350	- 35	- 65	- 25	- 25
21	---	---	---	---	---	---	---
22	300	435	595	- 65	-200	- 35	590
23	385	405	415	25	20	30	45
24	270	290	410	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A–6

Location X **Station** 262+50

DATE OF READING	July 17 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 31 1959	Sept 1 1959	Sept 1 1959
AGE OF PAVEMENT IN DAYS	251.94	276.13	276.68	277.13	298.13	298.68	299.14
AIR TEMPERATURE	75 F	70 F	39 F	64 F	52 F	34 F	62 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	620	100	240	150	–680	–680	–690
2	---	---	---	---	---	---	---
3	330	–260	680	–200	–945	–470	–1060
4	275	–415	225	–365	–395	– 75	–485
5	575	180	770	215	110	460	60
6	355	---	---	---	---	---	---
7	615	155	255	200	–400	–380	–385
8	---	---	---	---	---	---	---
9	– 50	–410	760	–390	–480	285	–650
10	– 55	–390	1120	–390	–355	600	–585
11	650	230	315	270	– 90	–110	–140
12	---	---	---	---	---	---	---
13	– 50	–155	–120	–180	–990	–950	–970
14	– 60	–130	–100	–150	–350	–330	–360
15	–825	–1065	190	–1125	–1140	–155	–1275
16	–900	–900	370	–960	–1005	10	–1150
17	–115	–185	–155	–205	–395	–375	–405
18	– 65	–150	–135	–175	–365	–345	–380
19	– 5	– 75	– 85	–105	–305	–295	–305
20	– 75	–145	–135	–165	–365	–355	–365
21	---	---	---	---	---	---	---
22	–110	–150	830	–190	–280	650	–360
23	– 5	–105	– 80	–125	–340	–335	–345
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD -- BOWNESS AVENUE

Section Type: A-5

Location: X Station: 262+50

Date of Readings	July 17 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 22 1959	Sept 1 1959
Age of Pavement in Days	251.00	270.15	271.15	272.11	282.11	293.11
Air Temperature	75 F	70 F	59 F	64 F	52 F	54 F	55 F
Gage No.	Soil Strain Gages (Micro in./in.)					
1	620	100	240	150	-560	-560	-650
2	---	---	---	---	---	---	---
3	230	-380	610	-200	-245	-127	-1060
4	275	-415	285	-365	-595	- 75	-465
5	575	180	775	215	110	490	65
6	355	---	---	---	---	---	---
7	115	155	255	200	-400	-380	-315
8	---	---	---	---	---	---	---
9	- 50	-420	750	-390	-420	265	-650
10	- 55	-390	1120	-290	-355	600	-505
11	650	230	315	270	- 90	-110	-140
12	---	---	---	---	---	---	---
13	- 50	-155	-120	-120	-990	-950	-970
14	- 60	-130	-100	-150	-450	-320	-360
15	-825	-1065	190	-1125	-1140	-155	-1575
16	-990	-900	270	-950	-1000	20	-1150
17	-115	-285	-155	-205	-395	-175	-405
18	- 65	-150	-325	-175	-305	-345	-380
19	- 5	- 75	- 95	-105	-205	-295	-305
20	- 75	-145	-135	-165	-365	-315	-365
21	---	---	---	---	---	---	---
22	-110	-150	430	-190	-290	-510	-240
23	- 5	-105	- 40	-130	-140	-310	-240
24	---	---	---	---	---	---	---

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A–6
Location X **Station** 262+50

DATE OF READING	Sept 2 1959	Jan 26 1960	Jan 27 1960	Jan 28 1960	Jan 29 1960		
AGE OF PAVEMENT IN DAYS	299.69	446.17	446.88	447.79	449.08		
AIR TEMPERATURE	36 F	13 F	6 F	2 F	35 F		
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-575	810	780	805	720		
2	---	---	---	---	---		
3	- 50	915	1110	1495	695		
4	- 55	750	875	1195	595		
5	470	790	925	1105	675		
6	---	---	---	---	---		
7	-165	885	530	535	485		
8	---	---	---	---	---		
9	240	440	470	1090	-335		
10	550	585	865	1350	290		
11	- 25	575	520	520	510		
12	----	---	---	---	---		
13	-910	560	580	575	555		
14	-280	525	545	540	515		
15	-255	435	710	1080	215		
16	-110	330	600	970	95		
17	-335	485	500	495	495		
18	-305	495	510	500	490		
19	-255	515	620	525	480		
20	-315	465	465	465	425		
21	---	---	---	---	---		
22	510	1020	1175	1445	810		
23	-285	490	495	490	465		
24	---	---	---	---	---		

INSTRUMENTATION DATA

Section Type: L-6

Location: [illegible] Station: 342-10

DATE OF READING	Sept 2 1959	Jan 16 1960	Jan 27 1960	Jan 29 1960	Jan 29 1960	
NO. OF PAVEMENT IN DAYS	209.00	146.17	146.69	146.72	146.00	
AIR TEMPERATURE	36 F	13 F	6 F	2 F	35 F	

SR-4 STRAIN GAUGE READINGS

Gage No.						
1	-575	810	760	805	750	
2	----	----	----	----	----	
3	- 50	915	1110	1405	595	
4	- 55	750	875	1195	595	
5	470	790	925	1105	675	
6	----	----	----	----	----	
7	-765	885	930	525	485	
8	----	----	----	----	----	
9	240	440	470	1090	-395	
10	550	585	865	1350	790	
11	- 25	375	430	520	510	
12	----	----	----	----	----	
13	-910	560	540	575	555	
14	-280	525	545	640	515	
15	-255	435	710	1050	215	
16	-110	370	600	970	55	
17	-335	485	530	475	485	
18	-305	485	510	500	490	
19	-255	315	620	525	480	
20	-315	465	445	465	425	
21	----	----	----	----	----	
22	710	1020	1175	1485	670	
23	-285	490	495	490	465	
24	----	----	----	----	----	

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A-6

Location X **Station** 262+50

DATE OF READING	June 22 1959	June 22 1959	June 23 1959	July 16 1959	July 16 1959	July 16 1959	July 17 1959
AGE OF PAVEMENT IN DAYS	227.06	227.32	227.70	250.94	251.09	251.27	251.67
AIR TEMPERATURE	64 F	52 F	46 F	72 F	72 F	70 F	48 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	----	----	----	.0039	.0034	.0043	.0283
2	----	----	----	.0044	.0038	.0046	.0317
3	----	----	----	.0052	.0048	.0058	.0274
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	62.0	65.7	56.3	76.1	78.8	83.6	68.1
2	64.3	64.0	56.3	76.6	79.7	83.6	65.9
3	65.7	61.3	55.9	83.6	84.1	84.1	64.1
4	63.9	63.5	55.9	78.3	80.1	81.9	64.1
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type _____ Station _____

Location _____

DATE OF PAVING						
AGE OF PAVEMENT IN DAYS						
AIR TEMPERATURE						

CRACK WIDTH MEASUREMENTS (0.001 INCH)

Plug No. 1						
2						
3						
4						
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No. 1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A-6

Location X **Station** 262+50

DATE OF READING	July 17 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 31 1959	Sept 1 1959	Sept 1 1959
AGE OF PAVEMENT IN DAYS	251.94	276.13	276.68	277.13	298.13	298.68	299.14
AIR TEMPERATURE	75 F	70 F	39 F	64 F	52 F	34 F	62 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0041	.0058	.0419	.0039	.0093	.0275	.0062
2	.0045	.0046	.0416	.0043	.0083	.0279	.0028
3	.0055	.0059	.0402	.0054	.0080	.0304	.0045
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	77.9	81.7	59.0	80.1	61.0	50.5	70.4
2	80.1	84.0	57.2	81.9	61.8	48.2	73.5
3	87.6	86.1	54.0	86.3	60.5	43.6	77.5
4	81.9	82.6	56.3	83.2	60.5	46.4	74.8
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD – BOWMISS ALBERTA

Section Type A-6

Location 1 Station 324+50

DATE OF READING	July 17 1959	July 10 1959	Aug 11 1959	Aug 23 1959	Aug 31 1959	Sept 2 1959	Sept 3 1959
ACC. OF PAVEMENT IN DEPTH	251.91	275.13	276.08	277.13	[illegible]	[illegible]	[illegible]
AIR TEMPERATURE	75 F	70 F	39 F	54 F	52 F	34 F	52 F

STRAIN WIDTH MEASUREMENTS (INCHES)

Plug No.							
1	.0041	.0058	.0049	.0029	.0023	.0275	.0260
2	.0045	.0046	.0043	.0040	.0023	.0279	.0263
3	.0055	.0059	.0032	.0054	.0030	.0304	.0245
4							
5							
6							
7							
8							

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No.							
1	77.9	81.7	59.0	80.2	62.0	59.5	70.4
2	80.1	84.0	57.2	81.9	61.8	48.2	73.2
3	81.6	86.2	54.0	86.3	60.5	43.6	77.3
4	81.9	82.0	56.3	83.2	60.5	45.4	74.8
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A-6

Location X **Station** 262+50

DATE OF READING	Sept 2 1959	Jan 26 1960	Jan 27 1960	Jan 28 1960	Jan 29 1960		
AGE OF PAVEMENT IN DAYS	299.69	446.17	446.88	447.79	449.08		
AIR TEMPERATURE	36 F	13 F	6 F	2 F	35 F		
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0269	.0154	.0210	.0262	.0106		
2	.0263	.0198	.0278	----	.0138		
3	.0272	.0255	.0250	.0299	.0217		
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	53.2	13.0	3.9	6.2	27.3		
2	51.0	12.5	3.4	5.3	29.2		
3	48.2	12.5	2.9	3.9	30.1		
4	49.6	12.5	0.5	4.9	29.6		
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — DOWNIES, ALBERTA

Section Type J-6

Location N Station 25+40

		Sept 2 1959	Jan 26 1960	Jan 27 1960	Jan 29 1960	Jan 29 1960
		299.49	446.27	446.28	447.79	447.08
		36 F	12 F	6 F	2 F	35 F
		CHECK WIDTH MEASUREMENT INCHES				
		.0269	.0154	.0210	.0282	.0206
		.0265	.0198	.0279	---	.0295
		.0272	.0295	.0295	.0299	.0217
		PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)				
		59.2	13.0	3.9	6.2	27.3
		71.0	12.5	3.4	5.3	29.2
		64.2	12.5	2.9	3.9	20.1
		49.4	12.5	0.5	4.9	29.4

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 7

Location XI **Station** 240+93

DATE OF READING	May 12 1959	May 12 1959	May 12 1959	May 12 1959	May 12 1959	May 13 1959	May 13 1959
AGE OF PAVEMENT IN DAYS	0.16	0.21	0.25	0.29	0.33	0.37	0.42
AIR TEMPERATURE	50° F			40° F			
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	5	15	30	35	45	55	65
2	5	15	30	40	45	55	65
3	5	20	30	35	45	50	60
4	5	15	25	35	45	50	60
5	10	20	30	40	50	55	60
6	10	15	30	35	40	50	55
7	10	25	40	50	60	65	70
8	10	30	40	55	60	70	80
9	10	25	40	55	65	75	85
10	5	25	35	45	55	60	70
11	–	–	–	–	–	–	–
12	10	30	40	50	60	70	75
13	5	20	35	45	55	60	70
14	15	15	80	40	45	65	60
15	10	30	40	55	60	70	80
16	20	35	50	85	75	85	100
17	10	25	40	50	65	70	75
18	–	–	–	–	–	–	–
19	10	25	35	45	55	65	70
20	5	20	30	40	45	55	60
21	15	25	35	45	55	60	70
22	10	20	35	45	55	60	70
23	10	25	40	50	55	65	70
24	10	25	40	40	55	65	70

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959
AGE OF PAVEMENT IN DAYS	0.46	0.5	0.54	0.58	0.63	0.67	0.71
AIR TEMPERATURE	35° F	33' F				35° F	
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	70	80	85	90	95	85	70
2	70	80	85	90	95	85	70
3	65	75	80	85	90	80	70
4	70	85	80	90	90	80	70
5	70	80	85	90	90	90	80
6	65	70	75	80	85	75	65
7	80	85	90	90	90	75	60
8	85	90	100	110	100	85	65
9	90	95	105	110	105	90	70
10	75	80	85	90	90	75	60
11	-	-	-	-	-	-	-
12	80	85	90	100	95	80	60
13	70	75	80	85	75	55	30
14	70	75	75	100	125	45	20
15	80	90	90	95	90	65	40
16	100	100	110	115	95	90	50
17	85	85	95	95	85	60	30
18	-	-	-	-	-	-	-
19	75	80	85	85	80	65	40
20	65	70	70	75	70	55	30
21	70	80	80	80	75	60	40
22	75	80	80	90	85	65	40
23	80	80	85	90	85	65	40
24	75	80	80	85	80	60	35

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959
AGE OF PAVEMENT IN DAYS	0.75	0.79	0.83	0.88	0.92	0.96	1.0
AIR TEMPERATURE							
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	45	25	-5	-30	-50	-65	-70
2	40	15	-20	-45	-65	-80	-70
3	40	25	-5	-30	-50	-60	-65
4	45	25	-5	-30	-50	-65	-75
5	50	30	0	-25	-40	-60	-65
6	35	15	-10	-40	-55	-70	-80
7	20	0	-25	-50	-65	-70	-75
8	20	-5	-40	-70	-85	-90	-95
9	25	0	-40	-75	-95	-105	-110
10	20	0	-30	-60	-75	-85	-105
11	-	-	-	-	-	-	-
12	20	0	-30	-65	-80	-90	-90
13	-15	-40	-70	-100	-110	-110	-110
14	-25	-35	-75	-	-95	-80	-
15	-5	-35	-75	-115	-125	-135	-130
16	0	-25	-70	-110	-125	-140	-130
17	-20	-45	-85	-125	-135	-145	-140
18	-	-	-	-	-	-	-
19	5	-20	-50	-95	-95	-105	-105
20	-5	-25	-50	-80	-90	-100	-100
21	0	-30	-60	-95	-110	-120	-120
22	0	-30	-70	-100	-115	-130	-130
23	-10	-35	-70	-110	-125	-140	-140
24	-5	-30	-65	-100	-110	-120	-120

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959	May 13 1959
AGE OF PAVEMENT IN DAYS	1.04	1.08	1.10	1.13	1.18	1.21	1.25
AIR TEMPERATURE							43° F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-75	-70	-70	-55	-35	-15	5
2	-90	-85	-85	-70	-50	-20	0
3	-65	-65	-65	-45	-10	55	170
4	-75	-75	-70	-50	-20	45	155
5	-70	-70	-70	-55	-35	0	85
6	-75	-75	-75	-60	-40	-5	75
7	-70	-60	-55	-35	-20	-5	10
8	-85	-80	-70	-45	-25	-10	5
9	-105	-95	-80	-50	0	85	225
10	-90	-85	-70	-45	0	85	220
11	-	-	-	-	-	-	-
12	-85	-80	-70	-55	-40	-20	-5
13	-90	-80	-70	-55	-25	-10	0
14	-115	-100	-90	-75	-45	-35	-20
15	-120	-105	-90	-45	0	70	190
16	-120	-100	-85	-45	5	90	220
17	-120	-105	-95	-75	-45	-25	-15
18	-	-	-	-	-	-	-
19	-95	-85	-75	-55	-35	-20	-10
20	-90	-80	-75	-55	-40	-20	-15
21	-115	-105	-95	-65	-30	15	150
22	-125	-120	-110	75	-35	10	150
23	-130	-125	-115	-90	-60	-40	-30
24	-115	-105	-95	-80	-55	-35	-25

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 13 1959	May 13 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959
AGE OF PAVEMENT IN DAYS	1.29	1.33	1.38	1.42	1.46	1.50	1.63
AIR TEMPERATURE	42°F	41°F	41°F	41°F	36°F	32°F	32°F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	20	25	35	40	35	45	45
2	15	20	25	35	30	40	40
3	240	270	285	300	275	280	285
4	220	250	270	280	260	270	270
5	135	160	180	190	180	190	190
6	120	145	160	180	170	170	190
7	15	20	20	20	20	20	20
8	15	20	20	20	15	20	20
9	305	345	365	380	355	360	365
10	300	335	350	365	335	340	340
11	-	-	-	-	-	-	-
12	20	15	20	30	25	30	35
13	10	10	10	10	5	10	10
14	-15	-15	-15	-15	-15	-15	-15
15	265	300	315	325	300	305	305
16	325	370	380	390	255	360	355
17	-5	-5	-5	-5	-10	-5	-5
18	-	-	-	-	-	-	-
19	-5	0	-5	0	-5	0	0
20	-10	-10	-10	-5	-10	-10	-10
21	245	280	305	330	300	300	300
22	250	295	320	335	310	315	320
23	-20	-15	-15	-10	-10	-10	-5
24	-15	-10	-10	-5	-10	-5	0

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 7

Location XI **Station** 240+93

DATE OF READING	May 14 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959
AGE OF PAVEMENT IN DAYS	1.69	1.77	1.83	1.95	2.01	2.06	2.20
AIR TEMPERATURE	52° F			68° F	68° F	66° F	
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	45	35	20	-15	-25	-20	5
2	35	40	10	-25	-30	-30	0
3	160	110	65	0	-10	-5	135
4	155	105	60	0	-15	-5	125
5	165	130	80	20	-10	15	90
6	150	110	65	10	-5	0	80
7	10	-5	-20	-50	-55	-45	-15
8	5	-10	-25	-60	-65	-60	-20
9	200	105	25	-65	-75	-60	150
10	180	95	20	-60	-65	-50	155
11	-	-	-	-	-	-	-
12	15	-10	-30	-70	-80	-70	-20
13	-20	-40	-60	-85	-90	-65	-35
14	-40	-60	-75	-105	-110	-95	-55
15	135	60	5	-60	-65	-45	145
16	180	90	30	-55	-60	-35	195
17	-35	-65	-85	-110	-115	-95	-45
18	-	-	-	-	-	-	-
19	-15	-25	-35	-65	-70	-60	-35
20	-20	-30	-35	-65	-65	-60	-35
21	180	115	65	0	-10	10	155
22	140	120	70	0	-10	0	155
23	-25	-55	-75	-110	-120	-100	-50
24	-20	-45	-65	-100	-105	-90	-45

INSTRUMENTATION DATA

TEST RUNS — RUNNING AVERAGE

Section Type 4 — 7

Location XX

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 7

Location XI **Station** 240+93

DATE OF READING	May 15 1959	May 15 1959	May 15 1959	May 15 1959	May 16 1959	May 16 1959	May 16 1959
AGE OF PAVEMENT IN DAYS	2.50	2.71	2.98	3.21	3.71	4.0	4.17
AIR TEMPERATURE	34° F	62° F	77° F	64° F	62° F	78° F	70° F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	35	40	-35	-25	25	-65	-55
2	30	30	-50	-30	15	-80	-65
3	280	150	-40	85	170	-75	5
4	270	150	-40	75	160	-80	0
5	175	155	-10	50	150	-40	-10
6	160	140	-20	35	130	-50	-25
7	10	0	-75	-45	-10	-100	-70
8	5	-5	-95	-50	-20	-120	-85
9	340	175	-125	95	205	-155	-15
10	325	155	-115	105	195	-135	5
11	-	-	-	-	-	-	-
12	25	5	-100	-50	-5	-125	-80
13	-10	-40	-120	-65	-55	-140	-95
14	-30	-60	-140	-85	-75	-165	-135
15	290	125	-110	100	140	-140	-5
16	340	155	-110	125	185	-140	10
17	-15	-100	-140	-75	-65	-165	-105
18	-	-	-	-	-	-	-
19	-15	-95	-95	-65	-40	-120	-95
20	-20	-70	-85	-65	-60	-110	-90
21	290	120	-30	110	180	-60	15
22	300	125	-40	110	180	-75	10
23	-15	-90	-135	-80	-50	-155	-110
24	-10	-115	-120	-70	-40	-140	-95

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 7

Location XI **Station** 240+93

DATE OF READING	May 17 1959	May 17 1959	May 18 1959	May 18 1959	May 18 1959	May 18 1959	May 19 1959
AGE OF PAVEMENT IN DAYS	4.70	5.0	5.5	5.75	5.94	6.09	6.63
AIR TEMPERATURE	64° F	75° F	48° F	59° F	52° F	48° F	42° F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	5	-45	10	20	15	25	35
2	0	-60	0	10	10	10	25
3	180	-40	220	130	185	225	205
4	170	-45	210	130	180	215	200
5	140	-10	135	135	130	140	160
6	120	-20	120	120	115	130	140
7	-25	-70	-10	-10	-10	-5	0
8	-35	-85	-20	-20	-20	-15	-10
9	215	-95	275	155	215	265	250
10	215	-75	265	140	205	255	235
11	–	–	–	–	–	–	–
12	20	-80	0	0	0	10	20
13	70	-110	-40	-50	-45	-40	-40
14	90	-135	-65	-75	-65	-55	-55
15	160	-95	205	85	150	190	160
16	200	-90	255	115	185	230	200
17	-75	-125	-45	-65	-55	-45	-45
18	–	–	–	–	–	–	–
19	-55	-95	-45	-40	-40	-35	-35
20	-60	-90	-45	-40	-45	-40	-40
21	190	-35	230	140	185	220	200
22	195	-50	230	140	190	230	200
23	-65	-130	-40	-50	-45	-35	-30
24	-55	-110	-30	-40	-40	-30	-20

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 19 1959	May 19 1959	May 20 1959	May 20 1959	May 20 1959	May 21 1959	May 21 1959
AGE OF PAVEMENT IN DAYS	6.96	7.26	7.67	8.19	8.29	8.37	8.46
AIR TEMPERATURE	50°F	46°F	45°F	46°F	45°F	38°F	37°F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	20	25	25	15	20	25	30
2	10	10	25	10	25	20	20
3	140	250	230	220	265	280	290
4	140	240	220	210	265	270	280
5	130	150	165	140	155	160	160
6	115	135	150	125	140	145	150
7	-10	-5	0	-10	-5	0	0
8	-25	-10	-10	-20	-5	-10	-10
9	155	300	275	245	320	345	350
10	150	290	255	245	300	325	330
11	-	-	-	-	-	-	-
12	-5	10	15	0	10	10	15
13	-60	-40	-40	-50	-40	-30	-30
14	-75	-55	-55	-65	-60	-50	-50
15	90	220	185	180	235	260	260
16	120	260	230	225	280	310	315
17	-65	-40	-45	-55	-45	-40	-35
18	-	-	-	-	-	-	-
19	-45	-35	-35	-45	-45	-35	-45
20	-50	-40	-40	-45	-45	-40	-40
21	135	235	220	210	255	270	275
22	135	240	220	210	255	280	280
23	-55	-35	-30	-50	-40	-35	-30
24	-50	-30	-25	-40	-30	-25	-20

INSTRUMENTATION DATA

TEST ROAD – [illegible]

Section Type 6 – 7

Location 21 [illegible] 21+043

Date/No.							
1	20	2	26	15	50	25	20
2	20	20	25	15	55	20	20
3	140	135	270	-20	265	260	260
4	240	230	220	210	265	270	280
5	220	150	215	200	225	205	260
6	225	205	215	215	240	245	250
7	-20	-5	0	-20	-5	0	0
8	-45	-20	-20	-20	-5	-20	-20
9	155	200	215	-45	220	215	200
10	150	200	225	-45	200	205	220
11	–	–	–	–	–	–	–
12	-5	20	15	0	20	10	15
13	-30	-40	-40	-30	-40	-40	-40
14	-75	-5	-45	-45	-20	-40	-20
15	30	200	185	180	225	215	210
16	120	220	220	215	220	210	210
17	-65	-40	-45	-55	-40	-40	-30
18	–	–	–	–	–	–	–
19	-45	-40	-35	-45	-40	-45	-45
20	-70	-40	-40	-45	-45	-45	-40
21	125	230	220	215	245	220	225
22	135	240	220	210	230	230	230
23	-45	-25	-20	-30	-40	-40	-20
24	-20	-20	-45	-40	-20	-45	-30

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 22 1959	May 22 1959	May 22 1959
AGE OF PAVEMENT IN DAYS	8.63	8.75	9.02	9.29	9.36	9.46	9.58
AIR TEMPERATURE	40° F	53° F	62° F	35° F	28° F	30° F	36° F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	35	35	15	20	25	25	35
2	30	30	10	10	20	20	25
3	280	160	130	305	430	350	380
4	280	160	125	290	320	340	365
5	165	150	125	160	170	175	190
6	150	135	105	145	155	160	180
7	0	-10	-25	-10	-5	-5	0
8	-10	-20	-35	-20	-15	-10	-10
9	345	170	125	365	405	430	455
10	320	155	130	350	385	405	425
11	-	-	-	-	-	-	-
12	20	0	-25	5	10	10	15
13	-40	-50	-95	-35	-30	-35	-35
14	-55	-80	-95	-55	-55	-55	-55
15	245	90	80	290	320	340	355
16	295	125	110	340	375	500	430
17	-40	-70	-85	-45	-35	-40	-40
18	-	-	-	-	-	-	-
19	-35	-40	-50	-40	-35	-35	-35
20	-40	-45	-50	-45	-40	-45	-40
21	265	150	135	300	330	360	380
22	270	155	140	305	340	370	395
23	-30	-50	-70	-40	-30	-35	-30
24	-25	-45	-60	-30	-25	-25	-20

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 22 1959	May 22 1959	May 22 1959	May 22 1959	May 22 1959	May 22 1959	May 22 1959
AGE OF PAVEMENT IN DAYS	9.69	9.81	10.03	10.73	10.81	10.90	10.97
AIR TEMPERATURE	54° F	59° F	63° F	62° F	70° F	73° F	75° F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	35	30	-5	35	25	-5	-25
2	25	25	-10	20	20	-10	-35
3	255	140	60	225	130	30	10
4	250	130	55	220	125	30	5
5	180	150	90	180	150	70	50
6	160	130	70	160	130	50	30
7	-10	-20	-40	-20	-25	-55	-60
8	-20	-30	-55	-30	-40	-70	-80
9	305	130	30	265	115	-30	-45
10	280	120	35	245	110	-25	-35
11	-	-	-	-	-	-	-
12	5	-20	-45	0	-20	-60	-75
13	-50	-80	-90	-65	-85	-120	-120
14	-70	-100	-115	-85	-105	-135	-140
15	210	65	5	180	55	-60	-65
16	260	100	25	220	85	-50	-55
17	-60	-95	-110	-75	-95	-135	-135
18	-	-	-	-	-	-	-
19	-40	-50	-65	-45	-55	-85	-95
20	-40	-50	-65	-50	-55	-80	-90
21	255	135	70	230	125	20	5
22	270	140	70	235	125	15	0
23	-40	-70	-90	-50	-70	-110	-120
24	-35	-60	-80	-40	-60	-100	-105

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 23 1959	May 24 1959	May 24 1959	May 25 1959	May 25 1959	May 25 1959	May 27 1959
AGE OF PAVEMENT IN DAYS	11.05	11.55	11.96	12.75	12.92	13.06	14.79
AIR TEMPERATURE	81° F	48° F	50° F	34° F	35° F	39° F	43° F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-30	10	5	45	50	35	30
2	-40	0	0	30	40	30	20
3	15	380	270	280	220	215	210
4	10	365	255	270	215	210	205
5	50	180	160	195	195	180	170
6	30	160	140	175	175	160	150
7	-60	-20	-30	5	10	-5	-15
8	-80	-30	-45	-5	0	-10	-25
9	-25	465	325	350	260	250	270
10	-15	445	305	305	240	235	245
11	-	-	-	-	-	-	-
12	-70	0	-25	30	30	10	15
13	-110	-50	-80	-30	-30	-50	-90
14	-130	-75	-100	-45	-50	-65	-95
15	-45	380	240	235	150	160	130
16	-30	440	290	285	195	200	175
17	-125	-55	-90	-35	-35	-55	-85
18	-	-	-	-	-	-	-
19	-90	-50	-65	-30	-25	-40	-90
20	-90	-55	-60	-35	-30	-40	-95
21	15	390	290	285	205	200	175
22	5	410	295	295	210	205	170
23	-115	-45	-70	-20	-20	-45	-70
24	-100	-40	-60	-15	-20	-40	-70

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 27 1959	May 28 1959	May 28 1959	May 29 1959	May 29 1959	May 29 1959	Jun 1 1959
AGE OF PAVEMENT IN DAYS	15.0	15.76	16.06	16.52	16.70	17.03	19.87
AIR TEMPERATURE	46° F	51° F	57° F	47° F	50° F	72° F	79° F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	25	50	30	45	45	35	10
2	0	40	35	30	35	20	-5
3	190	175	150	330	255	250	45
4	130	175	140	320	240	240	45
5	90	185	145	190	195	170	90
6	35	160	125	170	165	150	65
7	120	0	-20	0	-5	-15	-50
8	-55	-10	-25	-5	-10	-20	-70
9	205	210	135	410	295	285	-10
10	145	185	125	375	270	270	-5
11	-	-	-	-	-	-	-
12	-5	25	-5	30	20	10	-40
13	-120	-85	-100	-65	-80	-85	-165
14	-175	-105	-120	-80	-95	-105	-185
15	90	80	35	280	175	175	-110
16	100	120	70	340	225	220	-95
17	-250	-85	-105	-60	-80	-85	-175
18	-	-	-	-	-	-	-
19	-185	-80	-90	-75	-80	-85	-140
20	-180	-80	-90	-80	-80	-85	-135
21	75	145	110	295	210	220	-20
22	30	140	100	300	220	210	-40
23	-140	-65	-90	-55	-60	-70	-150
24	-80	-65	-85	-60	-65	-70	-140

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7
Location XI **Station** 240+93

DATE OF READING	Jun 1 1959	Jun 2 1959	Jun 2 1959	Jun 3 1959	Jun 4 1959	Jun 4 1959	Jun 5 1959
AGE OF PAVEMENT IN DAYS	20.0	20.71	21.02	22.04	22.63	23.0	24.0
AIR TEMPERATURE	79 F	66 F	73 F	73 F	46 F	72 F	73 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-15	25	-15	-55	15	-30	-80
2	-30	15	-30	-70	0	-45	-100
3	0	220	70	-35	390	85	-70
4	-5	210	60	-40	365	70	-80
5	45	170	75	5	180	60	-35
6	25	145	550	-20	155	40	-55
7	-70	-25	-60	-100	-30	-70	-115
8	-90	-35	-80	-120	-40	-85	-140
9	-65	255	45	-90	485	85	-130
10	-65	235	45	-80	455	85	-125
11	-	-	-	-	-	-	-
12	-65	-5	-50	-90	-5	-55	-110
13	-185	-110	-160	-200	-105	-115	-215
14	-200	-125	-175	-215	-125	-180	-230
15	-160	140	-50	-175	350	-10	-195
16	-150	185	-30	-160	420	15	-190
17	-190	-115	-165	-205	-105	-170	-225
18	-	-	-	-	-	-	-
19	-160	-95	-140	-185	-110	-150	-190
20	-150	-100	-135	-175	-110	-150	-185
21	-70	195	-10	-110	365	20	-125
22	-90	195	-20	-130	370	0	-150
23	-165	-90	-145	-195	-95	-155	-210
24	-155	-85	-135	-175	-90	-140	-190

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	Jun 6 1959	Jun 8 1959	Jun 8 1959	Jun 9 1959	Jun 9 1959	Jun 10 1959	Jun 12 1959
AGE OF PAVEMENT IN DAYS	24.72	26.53	27.0	27.60	28.0	29.33	31.0
AIR TEMPERATURE	52° F	45° F	70° F	44° F	67° F	45° F	80° F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-20	-5	-45	-5	-40	10	-65
2	-30	-15	-55	-20	-60	0	-90
3	390	395	-15	400	25	345	-80
4	365	375	-20	380	20	320	-90
5	165	175	10	175	20	180	-25
6	140	150	-10	150	0	160	-40
7	-60	-35	-80	-40	-85	-20	-90
8	-70	-45	-100	-50	-110	-30	-120
9	490	510	-60	525	-5	455	-135
10	465	480	-60	490	-5	425	-130
11	-	-	-	-	-	-	-
12	-40	-10	-70	-15	-75	0	-95
13	-180	-105	-175	-120	-180	-80	-180
14	-155	-120	-190	-135	-200	-100	-210
15	365	385	-140	410	-100	335	-220
16	440	465	-125	585	-80	410	-215
17	-205	-105	-185	-110	-195	-85	-215
18	-	-	-	-	-	-	-
19	-145	-115	-155	-115	-165	-85	-155
20	-140	-120	-155	-115	-160	-90	-160
21	400	405	-75	435	-60	355	-130
22	370	415	-95	445	-80	360	-150
23	-135	-100	-165	-105	-170	-80	-175
24	-130	-95	-155	-100	-155	-80	-170

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	Jun 22 1959	Jun 22 1959	Jun 23 1959	Jun 24 1959	Jul 13 1959	Jul 13 1959	Jul 14 1959
AGE OF PAVEMENT IN DAYS	40.98	41.23	41.63	42.88	62.02	62.22	62.56
AIR TEMPERATURE	62°F	54°F	48°F	67°F	75°F	62°F	45°F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-95	-85	-60	-45	-65	-155	-115
2	-100	-90	-70	-50	-165	-145	-110
3	70	230	245	5	-170	0	550
4	65	210	240	-5	-185	-30	490
5	30	90	105	30	-120	-30	180
6	10	60	80	10	-120	-40	150
7	-125	-85	-70	-65	-155	-120	-120
8	-145	-100	-95	-85	-200	-155	-150
9	135	340	345	-10	-205	95	740
10	75	315	310	-25	-210	85	690
11	-	-	-	-	-	-	-
12	-165	-75	-60	-60	-175	-145	-120
13	-250	-130	-130	-140	-240	-170	-170
14	-280	-165	-155	-175	-275	-200	-200
15	-70	220	225	-120	-300	10	645
16	-20	300	300	-95	-290	60	770
17	-270	-155	-145	-175	-295	-205	-205
18	-	-	-	-	-	-	-
19	-250	-145	-135	-135	-250	-195	-185
20	-250	-140	-140	-140	-255	-195	-200
21	-50	245	265	-75	-245	-20	660
22	-60	245	260	-90	-270	-40	670
23	-255	-130	-130	-140	-270	-190	-180
24	-255	-140	-130	-145	-255	-190	-180

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 7

Location XI **Station** 240+93

DATE OF READING	Jul 14 1959	Jul 14 1959	Jul 14 1959	Jul 15 1959	Jul 15 1959	Jul 16 1959	Jul 16 1959
AGE OF PAVEMENT IN DAYS	62.93	63.04	63.21	63.54	64.04	64.85	65.0
AIR TEMPERATURE	79°F	86°F	62°F	55°F	75°F	72°F	73°F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-155	-175	-165	-115	-155	-120	-155
2	-160	-180	-170	-120	-160	-120	-155
3	-170	-190	-90	540	-160	-80	-160
4	-180	-205	-110	480	-170	-100	-180
5	-110	-130	-100	180	-105	-60	-110
6	-110	-130	-110	150	-110	-70	-120
7	-160	-165	-145	-120	-160	-120	-160
8	-200	-210	-175	-150	-200	-170	-195
9	-215	-225	-45	735	-175	-85	-195
10	-225	-235	-70	685	-190	-105	-205
11	-	-	-	-	-	-	-
12	-180	-190	-160	-130	-175	-150	-175
13	-270	-265	-195	-170	-260	-225	-250
14	-305	-295	-225	-200	-285	-255	-275
15	-340	-340	-125	640	-290	-205	-290
16	-330	-330	-90	770	-280	-185	-285
17	-320	-320	-235	-200	-300	-270	-300
18	-	-	-	-	-	-	-
19	-265	-265	-220	-190	-265	-225	-250
20	-270	-270	-235	-195	-265	-230	-255
21	-260	-260	-140	640	-240	-170	-240
22	-290	-245	-170	655	-240	-200	-270
23	-290	-285	-225	-180	-270	-240	-270
24	-270	-270	-215	-180	-265	-225	-255

INSTRUMENTATION DATA

TEST ROAD – BOWNESS, ALBERTA

Section Type A – 7"

Location 32 Station 0+00 S

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 7

Location XI **Station** 240+93

DATE OF READING	Jul 16 1959	Jul 17 1959	Jul 17 1959	Jul 30 1959	Jul 30 1959	Jul 30 1959	Jul 30 1959
AGE OF PAVEMENT IN DAYS	65.19	65.56	65.85	78.58	78.83	79.05	79.21
AIR TEMPERATURE	68°F	48°F	75°F	48°F	68°F	79°F	60°F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-155	-120	-120	-85	-85	-145	-120
2	-155	-120	-120	-80	-80	-140	-110
3	-40	540	-130	370	-75	-160	-10
4	-65	485	-140	320	-90	-175	-35
5	-75	190	-70	190	-40	-110	-55
6	-85	155	-80	160	40	-115	40
7	-140	-130	-140	-100	-110	-140	-105
8	-170	-160	-180	-130	-150	-190	-140
9	15	745	-160	555	-105	-190	35
10	-5	695	-175	495	-145	-225	-10
11	-	-	-	-	-	-	-
12	-160	-135	-150	-100	-120	-160	-120
13	-200	-180	-250	-140	-190	-230	-155
14	-235	-215	-275	-160	-225	-245	-175
15	-80	640	-285	420	-230	-305	-75
16	-40	770	-270	525	-200	-300	-40
17	-235	-215	-295	-185	-245	-285	-200
18	-	-	-	-	-	-	-
19	-215	-195	-245	-165	-205	-235	-185
20	-225	-200	-250	-180	-210	-240	-190
21	-110	640	-225	460	-170	-240	-100
22	-130	650	-255	450	-200	-270	-125
23	-230	-190	-260	-165	-200	-245	-190
24	-225	-190	-250	-160	-200	-235	-190

INSTRUMENTATION DATA

TEST ROAD — MCINNES, ALBERTA

Section Type 1 — 7

Location .42 Station 2400+?

Date of Reading						
Temperature						
Moisture Content						
Cone No.						
1						
2						
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24						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 7

Location XI **Station** 240+93

DATE OF READING	Jul 31 1959	Jul 31 1959	Jul 31 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 13 1959
AGE OF PAVEMENT IN DAYS	79.59	79.77	80.03	90.04	90.59	91.04	93.04
AIR TEMPERATURE	48°F	70°F	77°F	70°F	39°F	59°F	68°F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-95	-65	-115	-85	-65	-85	-60
2	-90	-60	-120	-90	-70	-85	-50
3	375	60	-135	10	580	-20	10
4	320	30	-150	-35	505	-60	-35
5	185	55	-90	-30	225	-40	0
6	155	40	-90	-40	190	-50	-20
7	-105	-95	-125	-105	-110	-105	-90
8	-140	-125	-160	-140	-150	-140	-120
9	555	95	-165	15	765	-15	5
10	485	45	-185	-25	685	-60	-50
11	-	-	-	-	-	-	-
12	-110	-100	-140	-115	-110	-110	-90
13	-150	-165	-200	-170	-150	-180	-160
14	-165	-185	-225	-185	-175	-195	-175
15	420	-70	-280	-135	610	-185	-160
16	525	-30	-265	-100	740	-155	-130
17	-190	-215	-265	-235	-205	-240	-225
18	-	-	-	-	-	-	-
19	-175	-185	-215	-205	-200	-215	-185
20	-190	-190	-220	-210	-210	-220	-190
21	450	-60	-220	-140	670	-170	-125
22	450	-90	-240	-170	660	-200	-150
23	-170	-180	-230	-210	-190	-220	-190
24	-170	-175	-220	-200	-180	-210	-180

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	Aug 14 1959	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959	Aug 26 1959	Aug 31 1959
AGE OF PAVEMENT IN DAYS	93.58	94.04	104.02	104.58	105.05	105.60	111.03
AIR TEMPERATURE	45°F	72°F	62°F	37°F	64°F	46°F	50°F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-65	-85	-5	-35	-35	-25	-30
2	-60	-90	-10	-30	-20	-20	-10
3	395	-50	40	380	60	330	270
4	320	-100	-20	290	-10	250	180
5	200	-50	45	200	15	190	150
6	160	-60	30	165	-5	160	120
7	-100	-110	-30	-85	-70	-70	-80
8	-130	-150	-65	-110	-100	-100	-110
9	545	-75	25	495	60	445	225
10	465	-125	-35	405	-5	365	255
11	-	-	-	-	-	-	-
12	-95	-120	-40	-75	-70	-65	-80
13	-135	-180	-130	-100	-130	-90	-115
14	-155	-195	-145	-120	-145	-110	-135
15	400	-220	-165	340	-110	290	150
16	500	-200	-150	420	-90	370	215
17	-190	-245	-105	-175	-205	-165	-190
18	-	-	-	-	-	-	-
19	-185	-215	-185	-175	-195	-155	-175
20	-195	-220	-190	-185	-200	-165	-180
21	440	-180	-140	360	-110	320	180
22	420	-210	-180	335	-140	300	150
23	-175	-220	-185	-160	-190	-145	-165
24	-170	-210	-180	-155	-180	-140	-160

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	Sept 1 1959	Sept 1 1959	Sept 2 1959	Jan 26 1959	Jan27 1959	Jan 28 1959	Jan 29 1959
AGE OF PAVEMENT IN DAYS	111.58	112.05	112.59	259.07	259.77	260.70	261.98
AIR TEMPERATURE	34 F	62 F	37 F	6 F	7 F	2 F	34 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-25	-45	-15	180	165	190	125
2	-5	-20	0	250	250	270	215
3	410	0	430	640	795	985	410
4	320	-75	330	420	670	755	195
5	210	-30	210	360	370	410	275
6	160	-20	180	310	320	360	225
7	-90	-80	-75	- 20	-25	- 5	- 40
8	-135	-115	-105	- 55	- 60	- 40	- 75
9	505	5	425	610	750	950	95
10	405	-60	445	465	605	795	265
11	-	-	-	-	-	-	-
12	-90	-90	-70	5	5	25	- 20
13	-100	-130	-95	50	50	50	35
14	-115	-145	-115	30	30	30	10
15	340	-160	360	565	655	795	335
16	430	-140	450	675	775	935	440
17	-175	-210	-165	- 75	- 75	- 80	- 90
18	-	-	-	-	-	-	-
19	-170	-185	-165	-120	-115	-115	-130
20	-195	-190	-170	-120	-115	-115	-130
21	390	-130	395	540	670	815	-10
22	360	-165	380	515	650	805	320
23	-160	-190	-155	- 80	- 75	- 80	-100
24	-160	-190	-150	-65	- 60	- 60	-80

INSTRUMENTATION DATA

TEST ROAD – BOWDEN, ALBERTA

Section Type A – 7

Location 12 Station 6+043

DATE OF READING	Sept 1 1965	Sept 7 1965	Sept 14 1965	Sept 21 1965	Sept 28 1965	Oct 5 1965
AGE IN DAYS	334.44	340.44	347.44	354.44	361.70	368.44
AIR TEMPERATURE	64 F	52 F	37 F	0 F	7 F	34 F
Gauge No.	Thermocouple Readings (Micro in/in)					
1	-25	-45	-75	180	265	290
2	-5	-20	0	270	240	215
3	410	0	540	610	705	670
4	320	-75	310	420	670	755
5	220	-30	210	260	370	410
6	170	-20	100	210	340	360
7	-90	-60	-70	-20	-25	- 5
8	-295	-415	-305	-55	- 60	- 40
9	505	5	425	430	750	950
10	405	-50	415	460	460	705
11	-	-	-	-	-	-
12	-90	-40	-70	5	25	40
13	-300	-420	-345	50	50	50
14	-215	-445	-215	30	30	20
15	440	-420	360	565	655	795
16	450	-440	450	725	725	740
17	-275	-420	-475	- 75	- 75	- 60
18	-	-	-	-	-	-
19	-270	-445	-345	-220	-215	-220
20	-250	-420	-470	-125	-125	-250
21	395	-430	295	540	670	715
22	360	-470	450	720	650	820
23	-270	-300	-275	- 50	- 75	-200
24	-270	-350	-470	-55	- 40	- 60

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING							May 13 1959
AGE OF PAVEMENT IN DAYS							1.25
AIR TEMPERATURE							43 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1							.0100
2							.0077
3							.0206
4							.0046
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1							-
2							-
3							-
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INSTRUMENTATION DATA

TEST ROAD - ROWDEN LIBERTY

Section Type 4 - 7

Location [illegible]

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7
Location XI **Station** 240+93

DATE OF READING	May 13 1959	May 13 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959
AGE OF PAVEMENT IN DAYS	1.29	1.33	1.38	1.42	1.46	1.50	1. 63
AIR TEMPERATURE	42 F	41 F	41 F	41 F	36 F	32 F	32 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0125	.0200	.0114	.0096	–	–	–
2	.0038	.0106	.0110	.0094	–	–	–
3	.0089	.0100	.0108	.0090	–	–	–
4	.0062	.0075	.0094	.0102	–	–	–
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	–	–	–	–	–	–	–
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INSTRUMENTATION DATA

Section Type 4 — 7

Location D Station 4+00 to 5+00

DATE OF READING						
AVE. DAILY TEMPERATURE						
AVE. DAILY PAVEMENT TEMP. (°F)						
GAGE No. 1						
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16						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 14 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959	May 14 1959
AGE OF PAVEMENT IN DAYS	1.69	1.77	1.83	1.95	2.01	2.06	2.20
AIR TEMPERATURE	52 F			68 F	68 F	66 F	
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-	-	-	-	-	-	.0058
2	-	-	-	-	-	-	.0025
3	-	-	-	-	-	-	.0064
4	-	-	-	-	-	-	.0034
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	-	-	65.6	72.5	73.8	73.0	64.2
2	-	-	60.2	64.4	69.3	69.0	64.4
3	-	-	58.4	63.5	65.5	66.2	64.4
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INSTRUMENTATION DATA

TEST ROAD – BOWNESS, ALBERTA

Section Type A – 7

Location XI

Station 210+00

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7
Location XI **Station** 240+93

DATE OF READING	May 15 1959	May 15 1959	May 15 1959	May 15 1959	May 16 1959	May 16 1959	May 16 1959
AGE OF PAVEMENT IN DAYS	2.50	2.71	2.98	3.21	3.71	4.0	4.17
AIR TEMPERATURE		62 F	77 F	64 F	62 F	78 F	70 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	–	–	–	–	.0062	.0062	–
2	–	–	–	.0081	.0083	.0046	.0046
3	–	–	–	.0056	.0079	.0091	.0044
4	–	–	–	.0048	.0044	.0044	.0058
5							
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8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	47.1	54.3	81.4	64.6	69.3	82.2	73.0
2	52.0	50.5	75.0	66.2	70.7	78.7	75.5
3	48.5	48.5	69.0	67.0	67.8	72.0	73.5
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INSTRUMENTATION DATA

Section Type: A – 7

Location: [illegible] Station: [illegible]

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7 XI

Location **Station** 240+93

DATE OF READING	May 17 1959	May 17 1959	May 18 1959	May 18 1959	May 18 1959	May 18 1959	May 19 1959
AGE OF PAVEMENT IN DAYS	4.70	5.0	5.5	5.75	5.94	6.09	6.63
AIR TEMPERATURE	64 F	75 F	48 F	59 F	52 F	48 F	42 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0073	-	.0079	-	.0065	.0073	.0069
2	.0088	.0046	.0094	.0071	.0087	.0089	.0096
3	.0085	.0042	.0088	.0067	.0108	.0081	.0079
4	.0077	.0042	.0094	.0067	.0083	.0089	.0077
5							
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7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	63.0	76.3	53.8	61.5	57.7	51.0	-
2	60.0	70.3	57.4	56.3	56.5	53.7	-
3	58.5	69.0	59.0	56.3	56.8	54.4	-
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INSTRUMENTATION DATA

TEST SOIL — ROANOKE, ALABAMA

Station Type — 2

Location — Station 120 — 7

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 19 1959	May 19 1959	May 20 1959	May 20 1959	May 20 1959	May21 1959	May 21 1959
AGE OF PAVEMENT IN DAYS	6.96	7.26	7.67	8.19	8.29	8.37	8.46
AIR TEMPERATURE	50 F	46 F	45 F	46 F	45 F	38 F	37 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0071	.0081	.0071	.0073	.0087	.0091	.0071
2	.0073	.0104	.0090	.0083	.0079	.0098	.0079
3	.0069	.0090	.0089	.0065	.0089	.0071	.0071
4	.0071	.0090	.0079	.0077	.0085	.0114	.0085
5							
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8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	59.5	52.0	45.5	56.5	52.0	46.5	45.0
2	56.5	55.5	45.5	59.0	53.5	49.5	47.0
3	55.0	55.5	45.5	59.0	54.5	51.0	49.0
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INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7
Location XI **Station** 240+93

DATE OF READING	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 22 1959	May22 1959	May 22 1959
AGE OF PAVEMENT IN DAYS	8.63	8.75	9.02	9.29	9.36	9.46	9.58
AIR TEMPERATURE	40 F	53 F	62 F	35 F	28 F	30 F	36 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0065	.0090	.0071	.0065	-	-	.0100
2	.0085	.0098	.0079	.0083	-	-	.0115
3	.0071	.0071	.0071	.0075	-	-	.0119
4	.0087	.0094	.0085	.0087	-	-	.0104
5							
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8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	45.0	55.0	62.5	47.5	42.9	41.4	42.2
2	46.0	51.5	60.5	51.0	47.0	43.7	45.7
3	47.0	49.0	58.0	53.0	49.0	46.2	45.7
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INSTRUMENTATION DATA

TEST YEAR — BUSINESS ACTIVITY

Section/Type _____ Station _____

Location _____

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May22 1959	May 22 1959	May22 1959	May 23 1959	May 23 1959	May 23 1959	May 23 1959
AGE OF PAVEMENT IN DAYS	9.69	9.81	10.03	10.73	10.81	10.90	10.97
AIR TEMPERATURE	54 F	59 F	63 F	62 F	70 F	73 F	75 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0067	–	.0039	.0067	–	–	–
2	.0079	.0056	–	.0081	–	.0054	.0040
3	.0065	.0063	.0050	.0067	–	.0035	.0040
4	.0075	.0065	.0048	.0067	–	.0038	.0038
5							
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7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	48.4	67.0	72.5	53.4	69.3	67.1	77.3
2	48.4	56.8	69.3	46.8	58.5	60.0	71.1
3	48.8	55.6	65.0	49.0	57.2	54.0	66.2
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INSTRUMENTATION DATA

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7
Location XI **Station** 240+93

DATE OF READING	May 23 1959	May 24 1959	May 24 1959	May 25 1959	May25 1959	May 25 1959	May 27 1959
AGE OF PAVEMENT IN DAYS	11.05	11.55	11.96	12.75	12. 92	13.06	14.79
AIR TEMPERATURE	81 F	48 F	50 F	34 F	35 F	39 F	43 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	–	.0114	.0087	.0067	.0067	.0060	.0056
2	.0044	.0110	.0096	.0073	.0058	.0064	.0056
3	.0038	.0104	.0085	.0115	.0064	.0060	.0060
4	.0040	.0115	.0098	.0083	.0085	.0069	.0077
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	76.0	52.4	62.6	41.0	51.1	51.1	45.4
2	70.0	54.0	62.6	41.7	48.8	51.5	44.7
3	68.5	55.3	61.0	42.9	47.6	50.2	44.2
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INSTRUMENTATION DATA

TEST ROAD – JOHNSON COUNTY

Section Type ____ – ____

Location ____ Station ____

Gage No.						
Date of Reading						
Time of Reading						
Air Temperature						

GAGE READINGS AND TEMPERATURE CORRECTIONS

Gage No.						
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PAVEMENT TEMPERATURE READINGS AND CORRECTIONS

Gage No.						
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INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	May 27 1959	May 28 1959	May 28 1959	May 29 1959	May 29 1959	May 29 1959	June 1 1959
AGE OF PAVEMENT IN DAYS	15.0	15.76	16.06	16.52	16.70	17.03	19.87
AIR TEMPERATURE	46 F	51 F	57 F	34 F	47 F	50 F	72 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-	-	-	.0081	.0056	.0056	-
2	.0044	.0031	-	.0067	.0052	.0060	.0027
3	.0054	.0037	-	.0067	.0056	.0058	.0031
4	.0073	.0056	-	.0112	.0087	.0091	.0054
5							
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7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	49.6	50.0	-	36.8	41.3	53.0	75.1
2	49.2	45.3	-	33.8	41.3	52.5	68.5
3	48.2	43.7	-	41.9	40.4	51.8	62.6
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INSTRUMENTATION DATA

TEST ROAD — ROWAN'S ALLEY

Section Type: A – 7

Location: [illegible] Section: [illegible]

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	June 1 1959	June 2 1959	June 2 1959	June 3 1959	June 4 1959	June 4 1959	June5 1959
AGE OF PAVEMENT IN DAYS	20.0	20.71	21.02	22.04	22.63	23.0	24.0
AIR TEMPERATURE	79 F	66 F	73 F	73 F	46 F	72 F	73 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-	-	-	-	.0089	.0064	-
2	.0035	.0058	.0033	.0021	.0102	.0044	-
3	.0021	.0039	.0033	.0017	.0096	.0044	-
4	.0064	.0081	.0052	.0054	.0119	.0067	-
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	77.3	59.0	71.8	78.9	54.9	71.4	82.4
2	71.8	55.8	69.8	76.4	55.6	69.2	76.5
3	66.0	54.5	68.0	70.9	57.4	67.1	70.7
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INSTRUMENTATION DATA

TEST ROAD – EDMONTON, ALBERTA

Section Type A – 7

Location XI

Station 240+23

DATE OF READING	June 1 1959	June 2 1959	June 3 1959	June 4 1959	June 5 1959
AGE OF PAVEMENT IN DAYS	20.0	20.71	21.02	22.04	23.0
AIR TEMPERATURE	79 F	66 F	79 F	46 F	72 F

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No.						
2	.0056	.0058	.0053	.0021	.0102	–
3	.0021	.0039	.0039	.0017	.0096	–
4	.0064	.0091	.0052	.0054	.0129	–
5						
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8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No.						
2	77.3	59.0	72.8	78.9	54.9	72.4	82.4
3	71.3	55.8	69.9	76.4	55.6	69.2	76.5
4	66.0	54.5	68.0	70.3	57.4	67.1	70.7
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INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	June 6 1959	June 8 1959	June 8 1959	June 9 1959	June 9 1959	June10 1959	June12 1959
AGE OF PAVEMENT IN DAYS	24.72	26.53	27.0	27.60	28.0	29.33	31.0
AIR TEMPERATURE	52 F	45 F	70 F	44 F	67 F	45 F	80 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0123	.0135	-	.0114	-	.0098	-
2	.0114	.0104	.0023	.0114	-	.0096	.0096
3	.0112	.0104	.0029	.0112	-	.0102	.0025
4	.0162	.0100	.0052	.0129	-	.0108	.0108
5							
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7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	56.3	47.3	74.8	51.6	74.3	47.3	84.1
2	57.7	49.6	69.9	53.0	70.5	50.0	79.2
3	58.6	53.9	65.0	56.2	66.3	51.6	73.9
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INSTRUMENTATION DATA

TED ROAD — ROWLEY, ALBERTA

Section Type: A – 7

Location: 61 Station: 0+000.0

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	June 22 1959	June 22 1959	June23 1959	June24 1959	July 13 1959	July13 1959	July14 1959
AGE OF PAVEMENT IN DAYS	40.98	41.23	41.63	42.8	62.02	62.22	62.56
AIR TEMPERATURE	62 F	54 F	48 F	67 F	75 F	62 F	45 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0083	–	.0110	.0034	.0014	.0143	.0195
2	.0065	–	.0071	.0017	.0008	.0078	.0192
3	.0079	–	.0092	.0035	.0014	.0084	.0210
4	.0071	–	.0083	.0036	.0011	.0070	.0230
5							
6							
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8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	65.6	59.0	51.0	71.9	94.1	79.8	64.9
2	63.1	61.3	56.6	66.8	90.9	82.8	69.1
3	62.0	62.4	53.5	62.7	85.9	84.6	71.6
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INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type — 7

Location 21 **Station** 2[illegible]

DATE OF READING						
AGE OF PAVEMENT IN DAYS						
AIR TEMPERATURE						

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No						
1	.0063	—	.0120	.0134	.0110	.0127
2	.0035	—	.0072	.0090	.0070	.0076
3	.0079	—	.0090	.0091	.0080	.0078
4	.0071	—	.0062	.0084	.0071	.0076
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No						
1	65.6	79.0	74.0	84.2	78.2	80.6
2	67.2	81.2	75.6	86.2	78.2	80.2
3	67.0	82.4	75.5	87.2	81.4	78.2
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INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A-7
Location XI **Station** 240+93

DATE OF READING	Jul 14 1959	Jul 14 1959	Jul 14 1959	Jul 15 1959	Jul 15 1959	JUl 16 1959	Jul 16 1959
AGE OF PAVEMENT IN DAYS	62.93	63.04	63.21	63.54	64.04	64.35	65.0
AIR TEMPERATURE	79 F	86 F	62 F	55 F	75 F	72 F	73 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-.0018	-.0018	.0028	.0243	.0019	.0028	.0016
2	.0002	.0005	.0028	.0185	.0037	.0048	.0035
3	.0023	.0049	.0078	.0214	.0052	.0058	.0051
4	.0031	.0032	.0056	.0225	.0048	.0050	.0046
5							
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8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	100.9	98.5	83.5	62.0	86.0	85.8	91.4
2	90.7	94.4	85.7	65.8	82.6	78.7	83.8
3	84.8	88.8	87.0	69.2	80.0	77.0	81.3
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INSTRUMENTATION DATA

TEST ROAD – ROWLEES, ALBERTA

Section Type: L-T

Location: T1

Station: 10+47.1

DATE OF RECORDING	AUG 30 1979	AUG 30 1979	AUG 31 1979	SEP 1 1979	SEP 4 1979	SEP 14 1979
ACCUMULATIVE PAVEMENT LIFE LOSS	64.91	64.94	64.96	64.96	64.96	64.96
AIR TEMPERATURE	24 C	26 C	24 C	22 C	22 C	20 C
STRAIN MEASUREMENTS (MICRO)						
Plug No. 1	-.0021	-.0026	-.0029	-.0028	-.0028	-.0024
2	-.0016	-.0020	-.0024	-.0024	-.0024	-.0021
3	-.0029	-.0040	-.0037	-.0036	-.0036	-.0031
4	-.0031	-.0039	-.0040	-.0035	-.0035	-.0030
5						
6						
7						
8						
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)						
Sensor No. 1	100.0	99.6	89.6	89.6	89.6	81.4
2	89.2	92.3	82.4	82.4	82.4	75.2
3	91.9	98.8	89.0	89.6	89.6	82.6
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7
Location XI **Station** 240+93

DATE OF READING	Jul 16 1959	Jul 17 1959	Jul 17 1959	Jul 30 1959	Jul 30 1959	Jul30 1959	Jul 30 1959
AGE OF PAVEMENT IN DAYS	65.19	65.56	65.85	78.58	78.83	79.05	79.21
AIR TEMPERATURE	68 F	48 F	75 F	48 F	68 F	79 F	60 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0067	.0228	.0028	.0136	.0018	.0027	.0018
2	.0075	.0215	.0038	.0159	.0027	.0018	.0058
3	.0086	.0215	.0048	.0152	.0029	.0020	.0067
4	.0073	.0225	.0043	.0158	.0018	.0013	.0039
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	80.1	62.7	91.9	59.9	86.5	91.2	76.6
2	81.4	65.4	84.1	63.0	79.0	87.3	79.7
3	82.3	69.0	78.8	65.9	73.7	82.7	81.4
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

Section Type — 2

Location — 41 Station — 2+00.0

DATE OF READING						
ACC. OF PAVEMENT IN DAYS	65	129	65.50	21.00	7.00	7.00	7.00	7.00
AIR TEMPERATURE	68	67	75	64	69	70	70	70

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No.								
1	.0062	.0222	.0222	.0222	.0222	.0222	.0222	.0222
2	.0125	.0278	.0278	.0278	.0278	.0278	.0278	.0278
3	.0062	.0278	.0278	.0278	.0278	.0278	.0278	.0278
4	.0062	.0278	.0278	.0278	.0278	.0278	.0278	.0278
5								
6								
7								
8								

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

G-ge No.								
1	80.2	64.2	72.2	70.2	72.4	72.4	72.4	72.6
2	82.1	56.4	84.2	69.2	72.2	72.2	72.2	72.2
3	62.2	69.2	78.2	72.2	72.2	72.2	72.2	72.2
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7

Location XI **Station** 240+93

DATE OF READING	Jul 31 1959	Jul 31 1959	Jul 31 1959	Aug 10 1959	Aug 11 1959	Aug 11 1959	Aug 13 1959
AGE OF PAVEMENT IN DAYS	79.59	79.77	80.03	90.04	90.59	91.04	93.04
AIR TEMPERATURE	48 F	70 F	77 F	70 F	39 F	59 F	68 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0140	.0020	-.0023	.0002	.0178	-.0012	-.0005
2	.0162	.0060	.0022	.0077	.0216	.0060	.0046
3	.0167	.0071	.0035	.0060	.0198	.0055	.0051
4	.0163	.0037	.0029	.0030	.0203	.0020	.0026
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	56.9	77.5	89.4	83.3	53.7	81.9	81.7
2	58.7	71.9	82.7	81.7	56.0	79.5	78.6
3	63.0	69.9	80.9	79.3	60.8	76.6	73.1
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type — 7

Location 37 Station 70+00 E

DATE OF READING							
AGE OF PAVEMENT IN DAYS							
AIR TEMPERATURE							

CHECK WHEN MEASUREMENTS ARE TAKEN

Pick No.							
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						

CHECK WHEN TEMPERATURE READINGS TAKEN

Gage No.							
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7
Location XI **Station** 240+93

DATE OF READING	Aug 14 1959	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959	Aug 26 1959	Aug 31 1959
AGE OF PAVEMENT IN DAYS	93.58	94.04	104.02	104.58	105.05	105.60	111.03
AIR TEMPERATURE	45 F	72 F	62 F	37 F	64 F	46 F	50 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0127	-.0020	-.0010	.0106	0	.0089	.0075
2	.0156	.0033	.0041	.0137	.0050	.0122	.0108
3	.0163	.0047	.0042	.0133	.0054	.0120	.0104
4	.0150	.0018	.0029	.0123	.0030	.0111	.0098
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	53.1	81.0	79.0	48.7	75.5	56.8	59.6
2	56.3	78.8	74.6	51.9	72.6	59.0	60.7
3	58.4	75.0	71.1	55.1	72.6	60.4	59.6
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

WEST ROAD — ROANOKE, ALBERTA

Section Type [illegible] — 7

Location [illegible] Station 240+00

DATE OF READING											
AGE OF PAVT. (DAYS)											
AIR TEMPERATURE											
Plug No.											
1											
2											
3											
4											
5											
6											
7											
8											
Gage No.											
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 7
Location XI **Station** 240+93

DATE OF READING	Sept 1 1959	Sept 1 1959	Sept 2 1959	Jan 26 1960	Jan 27 1960	Jan 28 1960	Jan 29 1960
AGE OF PAVEMENT IN DAYS	111.58	112.05	112.59	259.07	259.77	260.70	261.98
AIR TEMPERATURE	34 F	62 F	37 F	6 F	7 F	2 F	34 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0120	-.0010	.0110	.0165	.0182	.0373	.0110
2	.0140	.0031	.0132	.0155	--	.0182	.0128
3	.0133	.0035	.0136	.0149	.0167	.0169	.0122
4	.0134	.0020	.0135	.0178	.0180	.0190	.0146
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	44.1	76.9	46.6	11.4	9.5	4.9	30.1
2	47.5	75.8	49.4	11.6	9.9	6.8	27.5
3	53.2	71.4	52.5	13.0	10.3	8.5	25.4
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD – BOWNESS, ALBERTA

Section Type: A – 7

Location: XI

Station: 440+42

Date of Reading						
Age of Pavement in Years	073.58	112.05	112.59	279.07	329.72	2Nov.70
Age in Months	24 #	62 #	37 #	/ /	/ /	/ /
Gage No.						
1	44.1	76.5	46.6	72.4	4.0	29.1
2	47.5	75.8	49.4	71.6	0.0	5.6	27.5
3	55.2	71.4	52.5	72.0	10.3	8.5	25.4
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
Plug No.						
1	.0120	-.0010	.0110	.0166	.0117	.0112
2	.0120	.0031	.0132	.0173	--	.0124	.0120
3	.0129	.0095	.0126	.0146	.0127	.0124	.0126
4	.0134	.0025	.0135	.0178	.0120	.0110	.0126
5						
6						
7						
8						
9						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	May 20 1959	May 20 1959	May 20 1959	May 20 1959	May 20 1959	May 20 1959	May 20 1959
AGE OF PAVEMENT IN DAYS	0.17	0.21	0.25	0.35	0.39	0.42	0.46
AIR TEMPERATURE	57 F	57 F	57 F	51 F	46 F	43 F	45 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-10	-40	-45	-50	-30	-10	10
4	-5	-25	-35	-35	-25	-15	0
5	-5	-25	-35	-30	-10	0	20
6	-5	-20	-30	-30	-20	-10	5
7	-15	-30	-40	-25	0	15	3 5
8	-10	-30	-40	-20	0	15	35
9	-10	-30	-40	-20	0	10	30
10	-10	-30	-	-20	0	-	35
11	-10	-30	-35	-20	0	10	30
12	-20	-45	-50	-40	-10	5	30
13							
14							
15							
16							
17							
18							
19	-10	-25	-30	-10	20	35	50
20	-10	-20	-30	-10	15	30	50
21	10	-20	-30	-5	25	40	60
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-15	-35	-40	-15	15	30	55

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	May 20 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959
AGE OF PAVEMENT IN DAYS	0.5	0.54	0.58	0.63	0.67	0.72	0.76
AIR TEMPERATURE	36 F	37 F	41 F	40 F	38 F	43 F	42 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	20	40	50	65	70	80	90
4	5	20	30	45	45	55	55
5	30	45	60	70	75	85	90
6	15	30	40	45	50	60	60
7	50	65	75	85	135	105	105
8	50	65	70	80	80	90	90
9	40	50	60	70	80	80	85
10	50	60	80	90	95	100	105
11	40	50	60	70	75	80	80
12	40	60	70	80	95	100	100
13							
14							
15							
16							
17							
18							
19	70	85	100	95	110	105	115
20	60	80	85	90	90	100	105
21	75	95	100	120	125	120	125
22	-	0	-	-	-	-	-
23	-	-	-	-	-	-	-
24	30	85	100	105	110	120	120

INSTRUMENTATION DATA

TEST BOAR – BOWDEN, ALBERTA

Section Type "A – B"

Location XLT

Survey 1979-37

DATE OF READING	May 20 1979	May 21 1979	May 21 1979	May 21 1979	May 21 1979	May 21 1979
AGE OF PAVEMENT IN DAYS	0 • 6	0 • 64	0 • 64	0 • 67	0 • 72	0 • 75
TEMPERATURE	76 F	37 F	41 F	42 F	42 F	42 F

Gage No.							
1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	35	40	50	65	70	80	80
4	5	20	50	45	45	55	55
5	30	45	60	70	75	80	80
6	15	20	40	45	50	60	60
7	50	65	75	85	125	105	105
8	50	65	70	80	80	30	30
9	40	50	60	70	60	80	85
10	50	60	80	90	95	100	105
11	40	50	60	70	75	80	80
12	40	60	70	80	95	100	100
13							
14							
15							
16							
17							
18							
19	70	85	100	95	110	105	115
20	60	80	80	90	90	100	105
21	75	95	100	120	120	120	125
22	–	0	–	–	–	–	–
23	–	–	–	–	–	–	–
24	30	85	100	105	110	120	120

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959
AGE OF PAVEMENT IN DAYS	0.80	0.83	0.93	1.0	1.10	1.18	1.30
AIR TEMPERATURE	42 F	45 F	52 F	59 F	60 F	61 F	60 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1							
2							
3	85	85	50	-10	-40	-70	-50
4	55	55	35	-15	-35	-60	-45
5	90	85	50	-5	-40	-70	-60
6	65	60	40	-10	-40	-60	-55
7	105	95	50	0	-15	-35	-15
8	90	80	45	-5	-15	-35	-20
9	85	80	45	-10	-30	-55	-30
10	105	100	55	-15	-35	-65	-30
11	80	75	40	0	-40	-70	-50
12	100	90	45	-10	-40	-90	-70
13							
14							
15							
16							
17							
18							
19	115	105	55	-10	-105	-135	0
20	105	95	50	5	-110	-135	0
21	125	125	70	0	-105	-140	0
22							
23							
24	115	105	50	10	-150	-190	-20

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 8
Location XII

Station 1959+53

DATE OF READING	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959
AGE OF PAVEMENT IN DAYS	0.80	0.83	0.93	1.0	1.10	1.18	1.30
AIR TEMPERATURE	42 F	45 F	52 F	59 F	60 F	61 F	60 F

SR-4 STRAIN GAGES (MICRO-IN./IN.)

Gage No.							
1							
2							
3	85	95	50	-10	-40	-70	-50
4	55	55	35	-15	-35	-60	-45
5	90	85	50	-5	-40	-70	-60
6	65	60	40	-10	-40	-60	-55
7	105	95	50	0	-35	-75	-15
8	90	80	45	-5	-15	-35	-20
9	85	90	45	-10	-30	-55	-30
10	105	100	55	-15	-35	-65	-30
11	80	75	40	0	-40	-70	-50
12	100	90	45	-10	-40	-90	-70
13							
14							
15							
16							
17							
18							
19	115	105	55	-10	-105	-135	0
20	105	95	50	5	-110	-135	0
21	125	125	70	0	-105	-140	0
22							
23							
24	115	105	50	10	-150	-200	-50

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	May 21 1959	May22 1959	May 22 1959	May 22 1959	May 22 1959	May22 1959	May 22 1959
AGE OF PAVEMENT IN DAYS	1.47	1.55	1.64	1.79	1.84	1.99	2.04
AIR TEMPERATURE	47 F	32 F	28 F	34 F	42 F	61 F	60 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	220	680	715	540	450	60	-5
4	180	655	695	525	435	65	-10
5	120	520	570	640	475	90	15
6	110	500	355	510	445	65	0
7	70	95	110	105	95	45	20
8	60	80	90	90	80	40	15
9	240	895	960	780	655	110	30
10	310	970	1035	840	695	100	5
11	30	250	295	285	385	175	90
12	35	285	340	350	340	190	90
13							
14							
15							
16							
17							
18							
19	90	-20	20	50	35	-10	-40
20	80	-30	10	40	25	-15	-45
21	310	860	980	840	700	135	30
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	70	-65	-20	25	0	-65	-100

INSTRUMENTATION DATA

TEST NO. 6 — NOVEMBER, AUGUST

Section Type: A – B

Location: XXX

Station: 1,000+50

DATE OF READING	May 21 1959	May 22 1959	May 22 1959	May 22 1959	May 22 1959	May 22 1959
SOIL COVER IN Depth	1.47	1.55	1.72	1.74	1.80	2.01
TEMPERATURE	87 F	92 F	90 F	92 F	92 F	89 F

1	–	–	–	–	–	–
2	–	–	–	–	–	–
3	220	680	715	585	610	–5
4	180	655	675	565	615	–10
5	220	520	570	540	575	75
6	320	500	395	520	565	0
7	70	95	110	105	55	20
8	60	80	50	90	80	15
9	240	895	900	780	655	30
10	320	970	1055	840	695	5
11	20	250	295	285	385	125
12	35	295	340	370	340	120
13						
14						
15						
16						
17						
18						
19	20	–20	20	50	75	–20
20	60	–50	20	40	25	–75
21	220	650	920	840	720	120
22	–	–	–	–	–	–
23	–	–	–	–	–	–
24	20	–45	–20	95	0	–5

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 8
Location XII **Station** 199+53

DATE OF READING	May 22 1959	May 22 1959	May 23 1959	May 23 1959	May 23 1959	May 23 1959	May 23 1959
AGE OF PAVEMENT IN DAYS	2.18	2.34	2.89	2.97	3.06	3.15	3.23
AIR TEMPERATURE	63 F	57 F	55 F	67 F	73 F	75 F	81 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	-110	-25	170	15	-110	-145	-160
4	-115	-45	150	5	-115	-155	-165
5	-90	-45	180	30	-90	-120	-135
6	5	-55	160	10	-90	-120	-135
7	25	10	45	20	-35	-50	-55
8	25	5	20	10	-40	-60	-65
9	105	0	225	40	-125	-165	-175
10	110	35	200	45	-130	-150	-155
11	15	55	215	95	10	-10	-15
12	10	60	250	110	10	-15	-20
13							
14							
15							
16							
17							
18							
19	-85	-25	30	15	-80	-95	-95
20	-180	-25	10	-10	-70	-90	-90
21	-90	60	280	95	-90	-120	-125
22	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–
24	-140	-60	-10	-55	-120	-140	-35

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	May 24 1959	May 24 1959	May 25 1959	May 25 1959	May 25 1959	May 26 1959	May 26 1959
AGE OF PAVEMENT IN DAYS	3.71	4.13	4.92	5.09	5.24	5.91	6.15
AIR TEMPERATURE	46 F	54 F	36 F	39 F	39 F	35 F	44 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	330	40	375	200	180	390	175
4	255	0	380	220	180	405	205
5	280	25	405	235	190	420	215
6	270	15	370	205	165	390	190
7	35	0	80	55	55	-40	-15
8	20	-10	75	50	50	-45	-20
9	420	50	530	260	235	545	230
10	540	110	555	260	255	565	215
11	200	90	255	235	220	260	220
12	240	100	320	280	260	325	265
13							
14							
15							
16							
17							
18							
19	20	-25	70	40	30	75	30
20	20	-25	55	30	25	60	25
21	570	110	580	290	270	585	255
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-40	-60	60	25	10	65	15

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	May 27 1959	May 27 1959	May 28 1959	May 28 1959	May 29 1959	May 29 1959	May 29 1959
AGE OF PAVEMENT IN DAYS	6.95	7.21	7.94	8.23	8.75	8.91	9.21
AIR TEMPERATURE	45 F	46 F	54 F	54 F	35 F	49 F	50 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	240	230	200	85	445	215	140
4	255	195	225	75	440	230	135
5	270	210	235	90	430	250	155
6	240	180	205	70	405	215	130
7	70	55	65	35	80	70	60
8	65	50	60	30	75	65	50
9	315	230	275	100	620	300	220
10	325	240	265	100	675	300	250
11	245	230	240	165	250	240	185
12	300	275	290	185	315	290	220
13							
14							
15							
16							
17							
18							
19	60	40	50	0	80	55	35
20	50	30	40	0	70	45	30
21	345	280	295	140	695	320	270
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	45	30	30	-25	75	40	20

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 4

Location XT1

DATE OF READING	May 27 1959	May 27 1959	May 28 1959	May 29 1959	May 29 1959	May 29 1959
AGE OF PAVEMENT IN DAYS	6.95	7.21	7.96	8.29	8.75	9.21
AIR TEMPERATURE	45 F	46 F	54 F	54 F	75 F	80 F	50 F

Gage No.							
1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	240	230	200	95	145	215	140
4	255	195	205	75	140	230	135
5	270	210	235	90	130	250	155
6	240	180	205	75	105	215	130
7	70	55	65	35	80	70	60
8	65	50	60	30	75	65	50
9	315	270	275	100	220	300	220
10	255	240	265	100	175	300	255
11	245	230	240	165	250	240	185
12	300	275	290	195	315	290	220
13							
14							
15							
16							
17							
18							
19	60	40	50	0	80	55	35
20	40	30	40	0	70	45	30
21	240	280	295	140	695	250	270
22	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–
24	45	20	30	-25	75	40	20

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	Jun 1 1959	Jun 1 1959	Jun 2 1959	Jun 2 1959	Jun 3 1959	Jun 3 1959	June 3 1959
AGE OF PAVEMENT IN DAYS	12.04	12.18	12.92	13.23	13.92	14.25	15.20
AIR TEMPERATURE	72 F	75 F	68 F	75 F	66 F	73 F	72 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-55	-125	80	-70	80	-125	-50
4	-50	-125	45	-90	55	-135	-75
5	-30	-95	75	-60	85	-105	-55
6	-40	-95	55	-60	65	-100	-60
7	-15	-45	5	-25	10	-55	-30
8	-20	-55	0	-30	0	-60	-40
9	-55	-130	105	-80	110	-140	-50
10	-55	-110	140	-45	145	-105	0
11	70	30	130	60	130	20	50
12	75	30	155	60	155	20	50
13							
14							
15							
16							
17							
18							
19	-55	-95	0	-60	-5	-95	-65
20	-50	-80	0	-60	-10	-90	-60
21	-20	-85	170	-20	180	-75	5
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-90	-130	-20	-80	-20	-120	-80

INSTRUMENTATION DATA

TEST ROAD — WORKING MONTH

Section Type 6 – 3

Location XII Series 1279-33

	Gun 1	Gun 2	Gun 3	Gun 4	Gun 5	Gun 6	Gun 7
DATE OF CALIBRATION	1279	1280	1279	1279	1280	1280	1280
VOLTAGE CALIBRATION	12.00	12.10	12.05	12.05	12.10	12.10	12.00
TEMPERATURE	72 F	75 F	68 F	70 F	69 F	73 F	72 F

Depth No.							
1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	−55	−125	80	−70	80	−125	−50
4	−50	−105	65	−90	55	−135	−75
5	−30	−95	75	−60	25	−105	−55
6	−40	−95	55	−50	05	−100	−50
7	−25	−45	5	−85	20	−75	−30
8	−20	−55	0	−30	0	−60	−40
9	−55	−130	105	−80	120	−140	−50
10	−55	−110	110	−45	140	−105	0
11	70	30	130	60	130	20	50
12	75	30	155	60	145	20	50
13							
14							
15							
16							
17							
18							
19	−55	−95	0	−60	−5	−95	−65
20	−50	−80	0	−60	−30	−80	−60
21	−20	−85	170	−20	130	−75	5
22	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–
24	−90	−130	−50	−80	−60	−120	−80

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	June 5 1959	June5 1959	June 5 1959	June 6 1959	June 8 1959	June 9 1959	June 9 1959
AGE OF PAVEMENT IN DAYS	15.81	16.10	16.21	16.92	19.18	19.71	20.19
AIR TEMPERATURE	50 F	75 F	73 F	52 F	70 F	42 F	67 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	320	-140	-160	280	-125	390	-110
4	235	-135	-175	185	-135	300	-125
5	295	-110	-135	210	-90	320	-85
6	280	-105	-130	240	-95	300	-90
7	5	-75	-90	-35	-55	10	-55
8	-45	-90	-95	-50	-65	0	-70
9	395	-165	-190	370	-140	475	-130
10	540	-140	-155	340	-120	640	-115
11	185	5	-10	-70	-20	190	25
12	215	5	-10	-70	-20	220	20
13							
14							
15							
16							
17							
18							
19	0	-125	-130	-40	-100	5	-100
20	-5	-120	-125	-40	-95	0	-90
21	520	-120	-135	500	-105	600	-90
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-10	-140	-150	-45	-110	100	-110

INSTRUMENTATION DATA

TEST ROAD — MOWMEDIL HIGHWAY

Section Type A – 2

Location XII Station 1234+55

Gage No.	Gage 1	Gage 2	Gage 3	Gage 4	Gage 5	Gage 6	Gage 7
Pavement Temp. (°F)	76.21	76.20	76.21	76.02	76.21	76.25	76.21
Pressure (psig)	50 #	75 #	75 #	52 #	75 #	75 #	52 #
1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	320	−140	−160	240	−165	340	−120
4	295	−125	−175	190	−125	500	−125
5	290	−120	−135	210	−90	520	−85
6	280	−105	−130	240	−95	530	−60
7	5	−75	−90	−95	−55	10	−55
8	−45	−60	−75	−50	−65	0	−70
9	305	−165	−190	170	−140	475	−150
10	540	−140	−155	340	−125	640	−125
11	185	5	−70	−70	−20	190	25
12	215	5	−70	−70	−20	220	20
13							
14							
15							
16							
17							
18							
19	0	−125	−130	−40	−100	*	−100
20	−5	−120	−125	−40	−95	0	−60
21	520	−120	−125	100	−120	600	−70
22	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–
24	−20	−140	−130	−45	−110	340	−110

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	June 10 1959	June 12 1959	June 22 1959	June 22 1959	June 23 1959	June24 1959	July 13 1959
AGE OF PAVEMENT IN DAYS	21.5	23.17	33.18	33.47	33.82	35.07	54.24
AIR TEMPERATURE	46 F	82 F	64 F	54 F	48 F	67 F	75 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	285	-180	-120	130	230	-30	-255
4	235	-185	-135	75	195	-35	-325
5	270	-140	-100	120	230	-5	-230
6	260	-125	-120	110	210	-20	-230
7	45	-85	-115	-25	-15	-35	-185
8	40	-95	-120	-30	-20	-35	-180
9	365	-220	-150	150	290	-50	-250
10	450	-210	-160	220	335	-60	-270
11	215	-10	-40	120	155	45	-80
12	250	-10	-40	140	190	50	-110
13							
14							
15							
16							
17							
18							
19	40	-130	-160	-30	-20	-60	-250
20	20	-130	-170	-45	-40	-70	-270
21	440	85	-170	230	330	-80	-335
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	20	-140	-170	-40	-30	-70	-270

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A — 9

Location [illegible] Station 109+52

DATE OF READING	1959	1959	1959	1959	1959	1959
AGE OF PAVEMENT IN DAYS	21.5	29.17	33.18	35.42	53.00	54.00
TEMPERATURE	46 F	82 F	64 F	54 F	68 F	62 F	72 F

MIL STRAIN (+ TENS. -MICRO-IN. IN.)

Gage No.							
1	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—
3	285	-180	-120	130	290	-30	-255
4	235	-185	-135	75	195	-75	-325
5	270	-140	-180	120	230	-5	-230
6	260	-195	-120	110	270	-20	-230
7	45	-95	-115	-25	-15	-25	-185
8	40	-95	-120	-30	-20	-25	-180
9	365	-220	-150	150	290	-50	-250
10	450	-210	-160	220	315	-60	-270
11	215	-10	-40	120	155	45	-80
12	250	-10	-40	140	190	50	-110
13							
14							
15							
16							
17							
18							
19	40	-120	-160	-30	-20	-60	-250
20	20	-130	-170	-45	-40	-70	-270
21	140	85	-170	230	390	-80	-295
22	—	—	—	—	—	—	—
23	—	—	—	—	—	—	—
24	20	-140	-170	-10	-30	-70	-270

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	Jul 13 1959	Jul 14 1959	Jul 14 1959	Jul 14 1959	Jul 14 1959	Jul 15 1959	Jul 15 1959
AGE OF PAVEMENT IN DAYS	54.43	54.76	55.14	55.25	55.42	55.75	56.25
AIR TEMPERATURE	62 F	45 F	79 F	86 F	62 F	55 F	75 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-60	480	-260	-280	-140	460	-215
4	-165	315	-325	-345	-225	295	-295
5	-90	330	-230	-255	-160	320	-200
6	-105	315	-230	-260	-180	310	-210
7	-125	-85	-210	-210	-145	-95	-175
8	-115	-90	-200	-195	-135	-90	-170
9	-20	580	-270	-280	-110	565	-205
10	-5	720	-295	-300	-110	700	-230
11	-25	110	-105	-110	-45	110	-70
12	-30	130	-130	-135	-60	120	-90
13							
14							
15							
16							
17							
18							
19	-160	-100	-280	-280	-180	-110	-230
20	-180	-120	-290	-300	-210	-130	-250
21	-50	620	-370	-375	-160	600	-295
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-170	-110	-290	-295	-200	-110	-250

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – 4

Location XII Station 209+52

DATE OF READING	1959	1959	1959	1959	1959	1959
AGE OF PAVEMENT IN DAYS	54.43	54.76	55.14	55.45	55.46	55.75	56.25
AIR TEMPERATURE	62 F	45 F	79 F	86 F	66 F	55 F	74 F

SR-4 STRAIN GAGES (MICRO-IN./IN.)

Gage No.							
2	–	–	–	–	–	–	–
3	–60	440	–260	–280	–140	460	–415
4	–165	315	–325	–345	–225	205	–295
5	–70	230	–250	–255	–160	320	–200
6	–105	345	–230	–260	–180	320	–210
7	–125	–85	–210	–210	–145	–95	–175
8	–115	–90	–200	–195	–145	–90	–120
9	–20	540	–270	–280	–140	565	–205
10	–5	720	–295	–300	–110	700	–230
11	–25	710	–105	–110	–45	710	–70
12	–30	720	–130	–125	–60	720	–90
13							
14							
15							
16							
17							
18							
19	–160	–100	–280	–280	–180	–110	–230
20	–180	–120	–290	–300	–210	–130	–250
21	–50	620	–270	–275	–160	600	–295
22	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–
24	–170	–110	–250	–295	–200	–110	–250

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	Jul 16 1959	Jul 16 1959	Jul 16 1959	Jul 17 1959	Jul 17 1959	Jul 30 1959	Jul 30 1959
AGE OF PAVEMENT IN DAYS	57.05	57.21	57.39	57.77	58.05	70.78	71.04
AIR TEMPERATURE	73 F	73 F	67 F	48 F	77 F	46 F	68 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-190	-230	-100	455	-195	250	-190
4	-245	-305	-195	285	-270	115	-265
5	-150	-210	-120	310	-175	210	-130
6	-165	-220	-140	300	-190	185	-180
7	-145	-185	-135	-105	-170	-65	-160
8	-140	-180	-130	-100	-170	-70	-155
9	-170	-220	-60	565	-200	345	-120
10	-190	-250	-55	700	-235	400	-180
11	-45	-80	-35	100	-70	130	-60
12	-60	-105	-50	110	-85	145	-75
13							
14							
15							
16							
17							
18							
19	-205	-250	-180	-120	-235	-75	-160
20	-220	-265	-200	-140	-255	-100	-180
21	-250	-320	-110	600	-300	350	-130
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-220	-260	-190	-135	-250	-90	-185

INSTRUMENTATION DATA

TEST ROAD — SOWNESS, ALBERTA

Section Type A – B
Location XII
Station 202+53

DATE OF READING	Jul 16 1959	Jul 16 1959	Jul 16 1959	Jul 17 1959	Jul 17 1959	Jul 20 1959
AGE OF PAVEMENT IN DAYS	57.05	57.21	57.39	57.77	58.05	70.78
AIR TEMPERATURE	73 °F	73 °F	67 °F	68 °F	77 °F	66 °F

SR-6 STRAIN GAGES (MICRO-IN./IN.)

Gage No.							
1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	–120	–230	–100	455	–195	250	–130
4	–245	–205	–195	285	–170	115	–265
5	–150	–210	–120	310	–175	210	–130
6	–165	–220	–140	300	–190	165	–150
7	–145	–185	–155	–105	–175	–65	–160
8	–140	–180	–130	–100	–170	–70	–155
9	–170	–220	–60	565	–600	345	–120
10	–190	–250	–55	700	–235	400	–180
11	–45	–80	–35	100	–70	130	–60
12	–60	–105	–50	110	–85	145	–75
13							
14							
15							
16							
17							
18							
19	–205	–250	–180	–120	–255	–75	–160
20	–220	–265	–200	–140	–254	–100	–180
21	–250	–320	–170	600	–300	250	–190
22	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–
24	–220	–260	–190	–195	–250	–90	–185

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	Jul 30 1959	Jul 30 1959	Jul 31 1959	Jul 31 1959	Jul 31 1959	Aug 10 1959	Aug 11 1959
AGE OF PAVEMENT IN DAYS	71.25	71.42	71.79	71.97	72.25	82.24	82.79
AIR TEMPERATURE	77 F	50 F	48 F	70 F	77 F	70 F	
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-305	-170	245	-130	-290	-160	480
4	-380	-255	105	-205	-370	-255	305
5	-270	-170	200	-110	-255	-155	350
6	-290	-200	180	-140	-275	-180	330
7	-215	-125	-75	-120	-205	-135	-65
8	-210	-120	-70	-110	-200	-130	-70
9	-230	-60	340	-50	-220	-50	640
10	-290	-90	395	-100	-280	-105	710
11	-110	-30	120	-20	-120	-30	135
12	-140	-45	140	-30	-130	-50	160
13							
14							
15							
16							
17							
18							
19	-220	-130	-80	-125	-220	-	-70
20	-250	-160	-105	-150	-245	-185	-95
21	-330	-130	345	-150	-310	-190	510
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-250	-150	-95	-150	-240	-180	-80

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – B

Location [illegible] **Station** [illegible]

DATE OF READING							
AGE OF PAVEMENT IN DAYS							
AIR TEMPERATURE							

SR-4 STRAIN GAGES (MICRO-IN./IN.)

Gage No.							
1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	−305	−270	245	−230	−290	−250	190
4	−350	−255	105	−105	−270	−255	205
5	−270	−170	200	−120	−245	−195	245
6	−220	−200	150	−140	−275	−180	220
7	−215	−195	−95	−120	−200	−125	−65
8	−210	−150	−70	−110	−300	−120	−70
9	−230	−60	340	−50	−100	−50	140
10	−290	−90	595	−100	−290	−105	210
11	−170	−20	120	−30	−120	−70	135
12	−140	−45	140	−30	−130	−50	160
13							
14							
15							
16							
17							
18							
19	−220	−190	−80	−125	−210	–	−70
20	−250	−160	−105	−110	−190	−185	−90
21	−230	−140	−45	−110	−210	−100	510
22	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–
24	−260	−150	−45	−120	−200	−120	−80

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	Aug 11 1959	Aug 13 1959	Aug 14 1959	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959
AGE OF PAVEMENT IN DAYS	83.25	85.25	85.79	86.25	96.23	96.78	97.25
AIR TEMPERATURE	59 F	66 F	45 F	66 F	61 F	37 F	63 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-150	-110	335	-140	-100	310	-30
4	-250	-195	180	-235	-180	165	-130
5	-150	-100	280	-135	-80	270	-35
6	-180	-130	255	-160	-105	240	-60
7	-135	-135	-55	-145	-115	-15	-95
8	-130	-125	-50	-140	-110	-30	-90
9	-40	50	455	20	55	430	110
10	-90	0	490	-40	-20	430	50
11	-30	20	140	-20	-20	160	45
12	-50	10	165	-40	15	180	40
13							
14							
15							
16							
17							
18							
19	-150	-130	-50	-155	-130	-30	-100
20	-170	-150	-80	-180	-150	-55	-120
21	-180	-170	320	-210	-185	290	-130
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-170	-150	-70	-175	-140	-50	-120

INSTRUMENTATION DATA

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	Aug 26 1959	Aug 31 1959	Sept 1 1959	Sept 1 1959	Sept 2 1959	Jan 26 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	97.79	103.25	103.78	104.25	104.79	251.27	251.96
AIR TEMPERATURE	46 F	50 F	34 F	62 F	37 F	6 F	9 F
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	245	200	365	-55	380	570	760
4	110	55	225	-150	225	445	630
5	210	160	300	-55	320	540	675
6	190	140	270	-85	285	485	620
7	-25	-65	-30	-100	-25	75	70
8	-30	-70	-40	-100	-15	70	65
9	350	290	510	95	510	870	1015
10	340	295	515	20	520	665	815
11	150	110	150	40	160	275	275
12	170	120	180	40	185	310	305
13							
14							
15							
16							
17							
18							
19	-45	-100	-30	-110	-25	35	40
20	-65	-120	-60	-130	-50	30	35
21	210	90	315	-155	305	410	535
22	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-
24	-60	-115	-50	-130	-40	10	15

INSTRUMENTATION DATA

TEST ROAD — ROWDOGS, ALBERTA

Section Type A – 3

Location [illegible]

DATE OF	Aug 26 1972	Aug 31 1950	Sept 1 1951	Sept 2 1952	Sept 3 1953	Sept 4 1954
AGE OF PAVEMENT IN DAYS	72.79	102.24	103.26	104.63	105.79	106.
AIR TEMPERATURE	46 F	50 F	74 F	60 F	77 F	6 F

Gauge No.							
1	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–
3	245	200	164	-44	340	220	240
4	110	45	245	-130	295	945	[illegible]
5	210	150	200	-55	250	340	[illegible]
6	100	240	270	-45	[illegible]	845	[illegible]
7	-24	-65	-20	-200	-24	75	23
8	-20	-90	-40	-200	-14	20	35
9	350	200	270	95	520	270	742
10	340	294	444	20	420	645	309
11	150	120	140	40	150	275	272
12	170	120	190	40	180	320	845
13							
14							
15							
16							
17							
18							
19	-45	-100	-30	-120	-25		40
20	-65	-120	-60	-220	-54		20
21	270	20	375	-155	100		445
22	–	–	–	–	–	–	–
23	–	–	–	–	–	–	–
24	-60	-115	-50	-220	-40	70	5

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A-8

Location XII **Station** 199+53

DATE OF READING	Jan 28 1960	Jan 29 1960					
AGE OF PAVEMENT IN DAYS	252.90	254.18					
AIR TEMPERATURE	0 F	33 F					
SR-4 STRAIN GAGES (MICRO-IN./IN.)							
Gage No. 1	---	---					
2	---	---					
3	995	285					
4	860	205					
5	730	335					
6	680	270					
7	80	25					
8	75	25					
9	1300	285					
10	1150	325					
11	280	220					
12	310	260					
13							
14							
15							
16							
17							
18							
19	35	- 60					
20	30	- 70					
21	770	-150					
22	---	---					
23	---	---					
24	10	- 90					

INSTRUMENTATION DATA

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	May 20 1959	May 20 1959	May 20 1959	May 20 1959	May 20 1959	May 20 1959	May20 1959
AGE OF PAVEMENT IN DAYS	0.17	0.21	0.25	0.35	0.39	0.42	0.46
AIR TEMPERATURE	57 F	57 F	57 F	51 F	46 F	43 F	45 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	76.3	76.0	79.0	72.0	68.5	66.7	61.3
2	67.6	72.7	73.0	75.6	73.4	71.2	68.0
3	62.5	66.5	68.3	73.0	73.4	72.3	68.3
4							
5							
6							
7							
8							
9							
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12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD – BOWMER, ALBERTA

Section Type A – 8
Location XJ3

AIR TEMPERATURE	57 F	57 F	57 F	56 F	59 F	65 F
RAINFALL IN DAY	0.17	0.21	0.25	0.75	0.12	0.68
Gage No. 1	–	–	–	–	–	–
2	–	–	–	–	–	–
3						
4						
5						
6						
7						
8						
Gage No. 1	75.2	76.0	79.0	78.0	69.2	63.2
2	67.6	72.2	73.0	75.6	72.2	67.0
3	62.5	(66.2)	(68.2)	73.4	72.2	65.2
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location X_{II} **Station** 199+53

DATE OF READING	May 20 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959
AGE OF PAVEMENT IN DAYS	0.5	0.54	0.58	0.63	0.67	0.72	0.76
AIR TEMPERATURE	36 F	37 F	41 F	40 F	38 F	43 F	42 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	59.3	57.3	55.2	52.0	51.6	51.9	50.5
2	65.4	62.0	60.2	58.4	55.7	53.0	53.0
3	66.7	65.4	62.7	60.7	58.6	56.4	54.8
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — MONROE COUNTY

Location _____ Section Type _____

DATE OF READING							
DAYS AFTER CONSTRUCTION							
TEMPERATURE °F							
Gage No.							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959	May 21 1959
AGE OF PAVEMENT IN DAYS	0.80	0.83	0.93	1.0	1.10	1.18	1.30
AIR TEMPERATURE	42 F	45 F	52 F	59 F	60 F	61 F	60 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	51.3	54.0	64.0	62.7	68.6	70.5	67.3
2	53.8	55.0	59.1	64.5	66.3	70.5	70.0
3	55.4	55.9	56.4	61.6	62.0	67.8	68.5
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — EDMONTON, ALBERTA

Section/Type A – 3

Location XC1 Station 12+43.5

Date Of Observation	May 13 2:30	May 14 10:30	May 15 3:30	May 17 7:00	May 21 3:00	May 24 7:30	May 27 11:00	May 31 6:00
Deflection Of Pavement (in. 0.001)	0.70	0.84	0.93	1.10	1.27	1.13	1.04	0.97
Air Temperature	52 F	45 F	54 F	57 F	60 F	62 F	60 F	58 F

Check Point Measurements (Cont'd)

Point No.								
1	–	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–	–
3								
4								
5								
6								
7								
8								

Elevation Temperature (Concrete Pavement)

Gage No.								
1	51.3	54.0	54.0	58.7	59.6	70.5	70.5	70.5
2	52.8	53.0	59.3	60.5	60.3	70.5	70.5	70.5
3	55.4	55.9	56.4	61.6	62.0	69.8	69.5	69.5
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	May 21 1959	May 22 1959	May 22 1959	May 22 1959	May 22 1959	May 22 1959	May 22 1959
AGE OF PAVEMENT IN DAYS	1.47	1.55	1.64	1.79	1.84	1.99	2.04
AIR TEMPERATURE	40 F	32 F	28 F	34 F	42 F	61 F	60 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	-	-	-	.0177	.0154	-	.0033
2	-	-	-	.0183	.0171	-	.0052
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	53.9	47.9	42.8	42.7	49.1	65.3	69.0
2	59.3	53.4	48.8	46.6	48.7	55.9	61.3
3	62:0	56.0	52.6	48.2	49.1	53.6	56.5
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A – B

Location 121 Station 127+45

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	May 22 1959	May 22 1959	May 23 1959	May 23 1959	May 23 1959	May 23 1959	May 23 1959
AGE OF PAVEMENT IN DAYS	2.18	2.34	2.89	2.97	3.06	3.15	3.23
AIR TEMPERATURE	63 F	57 F	55 F	67 F	73 F	75 F	81 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0025	.0042	.0098	.0038	.0023	.0023	.0025
2	.0050	.0064	.0094	.0048	.0044	.0044	.0046
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	76.7	64.2	55.5	69.2	73.0	83.0	80.9
2	70.0	67.0	52.0	59.3	61.0	74.0	76.4
3	66.0	66.2	51.8	56.3	53.6	68.7	71.3
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST RUNS — NOMINAL ABILITY

Section Type: A – A

Location: XII

Station: 1900+00

Run No.	1	2	3	4	5	6

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	May 24 1959	May 24 1959	May 25 1959	May 25 1959	May 25 1959	May 26 1959	May 26 1959
AGE OF PAVEMENT IN DAYS	3.71	4.13	4.92	5.09	5.24	5.91	6.15
AIR TEMPERATURE	46 F	54 F	36 F	39 F	39 F	35 F	44 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0187	.0077	.0137	.0096	.0087	.0133	.0083
2	.0181	.0089	.0138	.0090	.0085	.0129	.0083
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	73.0	67.7	41.5	55.9	53.4	37.0	54.3
2	69.3	65.5	41.0	50.6	53.6	37.0	49.5
3	66.4	63.3	42.9	49.0	52.7	37.0	48.1
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — EDMONTON, ALBERTA

Section Type A – 9

Location XT1

LAYER OF PAVEMENT	May 24, 1960	May 25, 1960	May 26, 1960	May 31, 1960	June 7, 1960	Aug 24, 1960
AGG. OF PAVEMENT IN. DEPTH	3.71	4.13	4.36	5.08	5.24	5.91
AIR TEMPERATURE	44 F	54 F	36 F	39 F	39 F	40 F

CHECK WHITE MEASUREMENTS MADE

Plug No.						
1	.0187	.0077	.0127	.0096	.0077	.0062
2	.0181	.0089	.0128	.0090	.0085	.0092
3						
4						
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No						
1	73.0	67.7	41.5	53.4	73.0	64.2
2	69.2	65.5	41.0	50.6	73.6	73.0
3	66.4	63.3	42.9	52.0	72.7	73.0
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	May 27 1959	May 27 1959	May 28 1959	May 28 1959	May 29 1959	May 29 1959	May 29 1959
AGE OF PAVEMENT IN DAYS	6.95	7.21	7.94	8.23	8.75	8.91	9.21
AIR TEMPERATURE	45 F	46 F	54 F	54 F	35 F	49 F	50 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0098	.0079	.0065	-	.0146	.0077	.0079
2	.0096	.0075	.0069	-	.0148	.0073	.0067
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	46.0	51.2	46.7	63.8	36.1	46.8	53.0
2	45.1	50.3	42.8	58.9	39.6	44.0	53.0
3	44.9	49.2	42.8	55.2	42.1	43.1	52.7
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

DATE OF READING						
AGE OF PAVEMENT IN DAYS						
AIR TEMPERATURE						
CRACK WIDTH MEASUREMENTS (INCHES)						
Trig No. 1						
2						
3						
4						
5						
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)						
Gage No. 1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	June 1 1959	June 1 1959	June 2 1959	June2 1959	June 3 1959	June 3 1959	June 4 1959
AGE OF PAVEMENT IN DAYS	12.04	12.18	12.92	13.23	13.92	14.25	15.20
AIR TEMPERATURE	72 F	75 F	68 F	75 F	66 F	73 F	72 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0027	.0033	.0062	.0035	-	.0035	.0040
2	.0067	.0062	.0090	.0071	-	.0063	.0071
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	75.6	78.9	63.5	74.0	64.9	82.8	72.7
2	64.2	72.5	60.8	70.7	59.5	75.2	70.0
3	58.6	66.9	56.3	68.5	55.6	72.2	67.1
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

DATE OF READING	Time 1 1959	Time 2 1959	Time 3 1959	Time 4 1960	Time 5 1960	Time 6 1960	Time 7 1960
AIR TEMPERATURE (°F)	72 F	75 F	69 F	71 F	64 F	?	?
PAVEMENT TEMPERATURE (°F)	72.0	74.5	70.0	72.5	62.0	70.5	72.0

CHECK WIDTH MEASUREMENTS (INCHES)

Plug No.	Time 1 1959	Time 2 1959	Time 3 1959	Time 4 1960	Time 5 1960	Time 6 1960	Time 7 1960
1	.0027	.0032	.0025	.0062	–	.0063	.0063
2	.0067	.0062	.0090	.0072	–	.0073	.0072
3							
4							
5							
6							
7							
8							

PAVEMENT TEMPERATURE READINGS (FAHRENHEIT)

Gage No.	Time 1 1959	Time 2 1959	Time 3 1959	Time 4 1960	Time 5 1960	Time 6 1960	Time 7 1960
1	75.6	72.5	69.5	72.0	62.5	72.5	72.5
2	69.2	72.5	69.5	70.7	59.5	73.5	70.0
3	72.6	69.3	65.4	68.5	54.6	72.2	69.3
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	Jun 5 1959	Jun 5 1959	Jun 5 1959	Jun 6 1959	Jun 8 1959	Jun 9 1959	Jun 9 1959
AGE OF PAVEMENT IN DAYS	15.81	16.10	16.21	16.92	19.18	19.71	20.19
AIR TEMPERATURE	50 F	75 F	73 F	52 F	70 F	42 F	67 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0165	.0033	.0033	.0177	.0033	.0200	-
2	.0173	.0056	.0060	.0192	.0058	.0190	-
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	55.8	83.4	87.9	55.2	82.7	48.0	82.7
2	55.3	74.1	81.1	57.5	74.8	52.1	70.7
3	57.6	67.5	75.0	58.6	69.3	55.3	66.0
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

Section Type: A – E

Location: [illegible]

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	June10 1959	Jun 12 1959	Jun 22 1959	Jnu 22 1959	Jun 23 1959	Jun 24 1959	Jul 13 1959
AGE OF PAVEMENT IN DAYS	21.5	23.17	33.18	33.47	33.82	35.07	54.24
AIR TEMPERATURE	46 F	82 F	64 F	54 F	48 F	67 F	75 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0133	.0013	.0029	.0104	.0119	.0031	.0007
2	.0146	.0056	.0052	.0098	.0110	.0055	.0026
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	48.2	90.6	75.2	58.3	51.8	73.0	95.6
2	51.6	82.7	65.2	63.3	52.7	70.1	89.0
3	54.4	75.3	61.8	64.0	54.1	66.1	87.5
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	Jul 13 1959	Jul 14 1959	Jul 14 1959	Jul 14 1959	Jul 14 1959	Jul 15 1959	Jul 15 1959
AGE OF PAVEMENT IN DAYS	54.43	54.76	55.14	55.25	55.42	55.75	56.25
AIR TEMPERATURE	62 F	45 F	79 F	86 F	62 F	55 F	75 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0077	.0244	.0028	.0026	.0044	.0245	.0036
2	.0080	.0238	.0041	.0043	.0061	.0236	.0042
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	77.3	63.0	98.0	102.3	79.0	62.2	88.6
2	82.8	69.1	95.0	94.9	83.7	67.7	86.4
3	85.3	72.0	92.0	91.4	86.7	71.7	83.8
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — DOWNESS, ALBERTA

Section Type 6 – P

Location [illegible] **Station** [illegible]

DATE OF READING						
AGE OF PAVEMENT IN DAYS						
AIR TEMPERATURE						

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No. 1							
2							
3							
4							
5							
6							
7							
8							

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No. 1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	Jul 16 1959	Jul 16 1959	Jul 16 1959	Jul 17 1959	Jul 17 1959	Jul 30 1959	Jul 30 1959
AGE OF PAVEMENT IN DAYS	57.05	57.21	57.39	57.77	58.05	70.78	71.04
AIR TEMPERATURE	73 F	73 F	67 F	48 F	77 F	46 F	68 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0041	.0038	.0068	.0243	.0033	.0173	.0012
2	.0051	.0049	.0078	.0338	.0049	.0152	.0035
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	91.9	96.6	77.4	61.0	95.0	59.0	96.9
2	81.4	87.9	81.0	65.4	83.0	63.9	85.7
3	77.4	85.3	84.1	69.5	77.9	67.5	78.2
4							
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14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWMANVILLE, ALBERTA

Section Type A – C

Location 3.17 Station 1052+53

DATE OF READING						
AGE OF PAVEMENT IN DAYS						
AIR TEMPERATURE						
Plug No. 1						
2						
3						
4						
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8						
Stage No. 1						
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14						
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INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	Jul 30 1959	Jul 30 1959	Jul 31 1959	Jul 31 1959	Jul 31 1959	Aug 10 1959	Aug 11 1959
AGE OF PAVEMENT IN DAYS	71.25	71.42	71.79	71.97	72.25	82.24	82.79
AIR TEMPERATURE	77 F	50 F	48 F	70 F	77 F	70 F	
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0016	.0034	.0179	.0023	.0020	.0023	.0235
2	.0037	.0053	.0157	.0040	.0045	.0037	.0193
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	99.3	78.3	54.1	88.4	101.3	88.3	51.1
2	92.8	83.0	59.4	76.3	93.3	83.5	56.5
3	88.7	86.3	64.3	71.9	90.1	82.6	60.4
4							
5							
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13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Station Type _____ Station _____

Location _____

Gauge No.	Jul 20 1750	Jul 20 1845	Jul 21 1845	Jul 21 1750	Aug 20 1750	Aug 21 1750
Pavement Temperature	71.25	72.42	71.79	72.97	72.63	69.79
Air Temperature	77 F	80 F	83 F	79 F	77 F	79 F

Cracks with Measurements Inches

Gauge No.						
1	.0035	.0034	.0170	.0035	.0029	.0059
2	.0027	.0043	.0127	.0045	.0027	.0043
3						
4						
5						
6						
7						
8						

Pavement Temperature (Degrees Fahrenheit)

Gauge No.						
1	69.4	72.3	84.2	89.6	103.4	82.3	73.1
2	92.8	83.0	84.4	76.2	92.3	80.5	71.5
3	84.7	86.3	84.3	73.9	80.3	72.6	64.4
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13							
14							
15							

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8
Location XII **Station** 199+53

DATE OF READING	Aug 11 1959	Aug 13 1959	Aug 14 1959	Aug 14 1959	Aug 24 1959	Aug 25 1959	Aug 25 1959
AGE OF PAVEMENT IN DAYS	83.25	85.25	85.79	86.25	96.23	96.78	97.25
AIR TEMPERATURE	59 F	66 F	45 F	66 F	61 F	37 F	63 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0030	.0030	.0188	.0022	.0033	.0164	.0047
2	.0040	.0038	.0140	.0035	.0038	.0120	.0037
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	85.0	82.8	52.0	85.8	83.7	49.2	77.9
2	85.0	80.0	56.5	83.2	80.4	54.0	77.5
3	82.3	75.1	59.5	79.7	75.5	56.5	72.1
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INSTRUMENTATION DATA

TEST NO. [illegible] — ROTATING ASSEMBLY

Location [illegible] Station [illegible]

Plane or Station						

INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A - 8

Location XII **Station** 199+53

DATE OF READING	Aug 26 1959	Aug 31 1959	Sept 1 1959	Sept 1 1959	Sept 2 1959	Jan 26 1960	Jan 27 1960
AGE OF PAVEMENT IN DAYS	97.79	103.25	103.78	104.25	104.79	251.27	251.96
AIR TEMPERATURE	46 F	50 F	34 F	62 F	37 F	6 F	9 F
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0138	.0055	.0173	.0045	.0173	.0173	.0194
2	.0095	.0103	.0120	.0040	.0131	.011[2]	.0131
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	57.7	54.3	42.7	78.7	44.8	6.0	7.3
2	60.9	61.6	47.5	76.3	49.1	8.0	6.8
3	62.2	61.8	50.3	74.3	52.8	9.2	7.3
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INSTRUMENTATION DATA

TEST ROAD – DORMONT, ALBERTA

Section Type A – B

Location: V17 Station: 1+[illegible]

DATE OF READING	May 26 1959	Aug. 23 1960	Sept. 1 1959	June 1 (est) 1960	June 27 1960
AGE OF PAVEMENT IN DAYS	92.79	109.65	109.75	204.25	251.96
AIR TEMPERATURE	45 F	50 F	[illegible]	62 F	72 F

CHECK WITH ADJUSTMENTS ONLY

Plug No.						
1	.1258	.0056	.0175	.0045	.0122	.070
2	.0095	.0200	.0120	.0040	.0232	.0122
3						
4						
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREE FAHRENHEIT)

Plug No.						
1	47.9	51.3	42.7	73.7	74.3	7.3
2	50.9	51.6	47.5	75.3	69.1	5.0
3	52.2	53.8	51.9	71.7	72.4	5.2
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INSTRUMENTATION DATA

TEST ROAD — BOWNESS, ALBERTA

Section Type A-8
Location XII **Station** 199+53

DATE OF READING	Jan 28 1960	Jan 29 1960					
AGE OF PAVEMENT IN DAYS	252.90	254.18					
AIR TEMPERATURE	0 F	33 F					
CRACK WIDTH MEASUREMENTS (INCHES)							
Plug No. 1	.0215	.0135					
2	.0169	.0064					
3							
4							
5							
6							
7							
8							
PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)							
Gage No. 1	4.4	28.0					
2	6.8	25.4					
3	7.8	23.0					
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INSTRUMENTATION DATA

TEST ROAD – EDMONTON, ALBERTA

Section Type A–8

Location XJT Station 1+945.7

					Jan 27 1960	Jan 2 1961
					624.00	641.79
					0 F	33 F

CRACK WIDTH MEASUREMENTS (INCHES)

Plug No. 1					.0215	.0195
2					.0159	.0044
3						
4						
5						
6						
7						
8						

PAVEMENT TEMPERATURE (DEGREES FAHRENHEIT)

Gage No. 1					44.4	28.0
2					6.9	25.4
3					7.8	23.0
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